

OCT 3 1957

SWARTHMORE
COLLEGE
LIBRARY

SWARTHMORE COLLEGE BULLETIN

CATALOGUE ISSUE
1957-1958



LD5186
.C3
1957/58

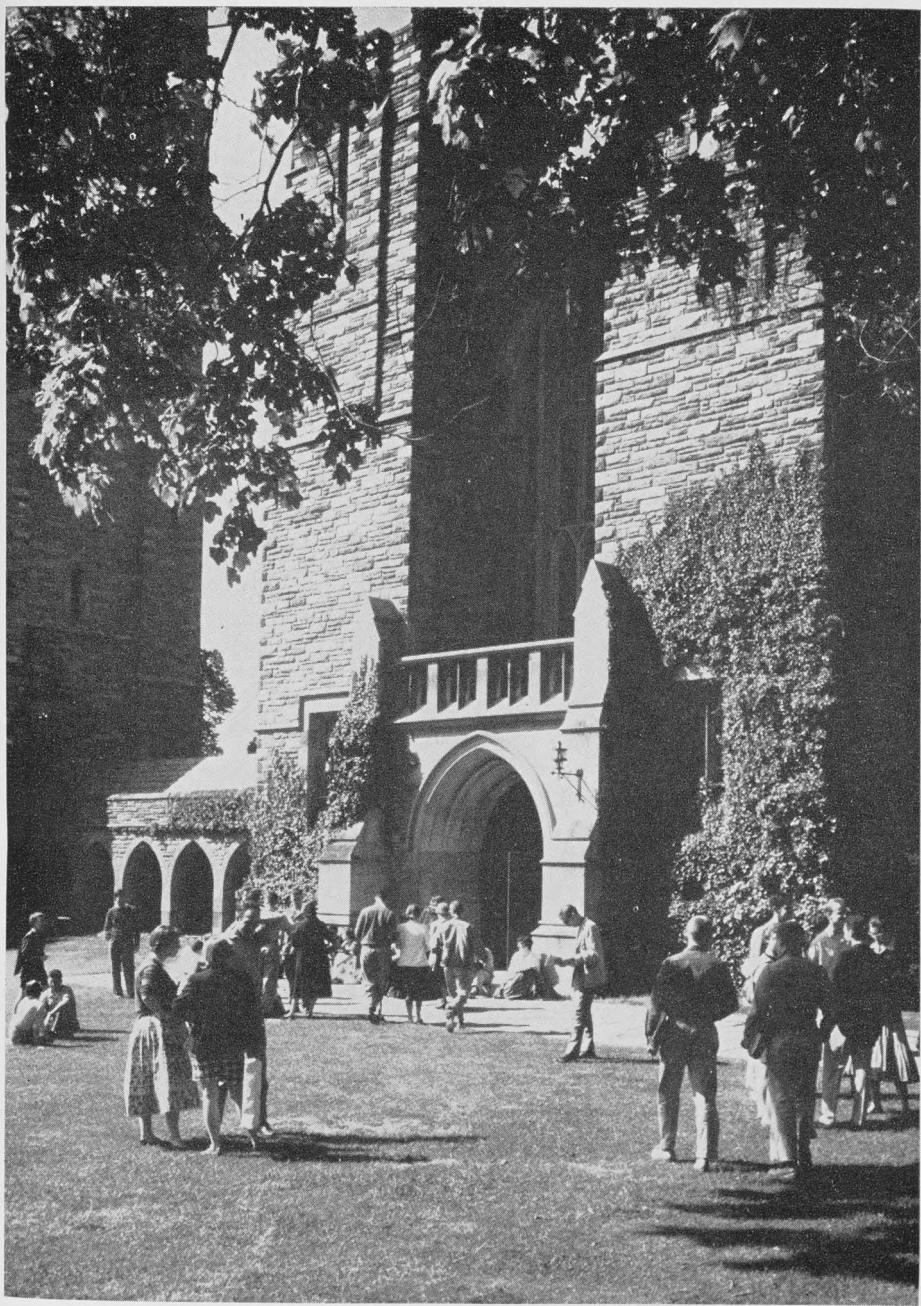
SWARTHMORE - PENNSYLVANIA

The Bulletin, of which this publication is Volume LV, No. 1, is published monthly, except August, by Swarthmore College, Swarthmore, Pennsylvania.

Entered at the post office at Swarthmore, Pa., as second-class matter, in accordance with provision of the Act of Congress of August 24, 1912.

Photographs by Grant Compton, BUSINESS WEEK, and Swarthmore College News Office.

(Printed in U. S. A.)



Clothier Memorial



Parrish Hall

SWARTHMORE COLLEGE BULLETIN

CATALOGUE ISSUE
1957-1958

SWARTHMORE, PENNSYLVANIA

Volume LV

Number 1

September 1957

Directions for Correspondence

For information about:

GENERAL COLLEGE POLICY

Courtney Smith, *President*

ADMISSIONS AND SCHOLARSHIPS

For men: Gilmore Stott, *Associate Dean*

For women: Deborah Wing, *Associate Dean*

RECORDS, TRANSCRIPTS AND CATALOGUES

John M. Moore, *Registrar*

FINANCIAL INFORMATION

Edward K. Cratsley, *Vice-President*

G. Caroline Shero, *Assistant Controller*

VOCATIONAL PLACEMENT AND GUIDANCE

Maralyn Orbison, *Director*

ALUMNI AFFAIRS AND PUBLIC RELATIONS

Joseph B. Shane, *Vice-President*

GENERAL INFORMATION

Maralyn Orbison, *Director of News Office*

The Rhodes Scholarship Trust

The Rhodes Scholarship Trust maintains an office in this country for the purpose of administering the selection of American Rhodes Scholars and conducting the affairs of the Rhodes Scholarships in the United States. This office was located at Swarthmore College during the presidency of Dr. Frank Aydelotte, who served as the first American Secretary. On the occasion of the appointment of Courtney Smith to the American Secretaryship this office was located in Princeton, N. J., and returned to Swarthmore when Dr. Smith took up his duties as president of the College in September 1953.

American Secretary of the Rhodes Scholarships, Courtney Smith
Assistant to the American Secretary, Prosser Gifford
Secretary, Elsa Palmer Jenkins

Table of Contents

	PAGE
CALENDAR	4
PERSONNEL	7
The Corporation and The Board of Managers	8
Alumni Association Officers and Alumni Council	11
The Faculty	12
Divisions and Departments	18
Standing Committees	19
Administrative Officers and Assistants	20
INTRODUCTION TO SWARTHMORE COLLEGE	23
Admission	28
Expenses	31
Student Aid and Scholarships	33
Educational Resources	42
College Life	46
Student Community	49
THE EDUCATIONAL PROGRAM	53
Program for Freshman and Sophomores	55
Program for Juniors and Seniors	57
Reading for Honors	58
Pre-Medical Program	60
Faculty Regulations	62
Requirements for Graduation	64
Advanced Degrees	64
Awards and Prizes	66
Fellowships	67
COURSES OF INSTRUCTION	69
Astronomy	70
Biology	72
Chemistry	78
Classics	82
Economics	85
Engineering	88
English Literature	100
Fine Arts	105
History	108
International Relations	113
Mathematics	114
Modern Languages and Literatures	117
Music	125
Philosophy and Religion	128
Physical Education for Men	133
Physical Education for Women	134
Physics	136
Political Science	138
Psychology and Education	143
Russian Studies	149
REFERENCE SECTION	151
Visiting Examiners	152
Degrees Conferred	153
Awards and Distinctions	157
Enrollment Statistics	159
Selected Publications About Swarthmore College	160
Index	161
PLAN OF COLLEGE GROUNDS	166

1957

OCTOBER							NOVEMBER							DECEMBER							
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	
			1	2	3	4	5						1	2	1	2	3	4	5	6	7
6	7	8	9	10	11	12	3	4	5	6	7	8	9	8	9	10	11	12	13	14	
13	14	15	16	17	18	19	10	11	12	13	14	15	16	15	16	17	18	19	20	21	
20	21	22	23	24	25	26	17	18	19	20	21	22	23	22	23	24	25	26	27	28	
27	28	29	30	31			24	25	26	27	28	29	30	29	30	31					

1958

JANUARY							FEBRUARY							MARCH							
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	
			1	2	3	4							1								1
5	6	7	8	9	10	11	2	3	4	5	6	7	8	2	3	4	5	6	7	8	
12	13	14	15	16	17	18	9	10	11	12	13	14	15	9	10	11	12	13	14	15	
19	20	21	22	23	24	25	16	17	18	19	20	21	22	16	17	18	19	20	21	22	
26	27	28	29	30	31		23	24	25	26	27	28	23	24	25	26	27	28	29		
														30	31						

APRIL							MAY							JUNE								
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S		
			1	2	3	4	5						1	2	3	1	2	3	4	5	6	7
6	7	8	9	10	11	12	4	5	6	7	8	9	10	8	9	10	11	12	13	14		
13	14	15	16	17	18	19	11	12	13	14	15	16	17	15	16	17	18	19	20	21		
20	21	22	23	24	25	26	18	19	20	21	22	23	24	22	23	24	25	26	27	28		
27	28	29	30				25	26	27	28	29	30	31	29	30							

JULY							AUGUST							SEPTEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
			1	2	3	4	5						1	2	1	2	3	4	5	6
6	7	8	9	10	11	12	3	4	5	6	7	8	9	7	8	9	10	11	12	13
13	14	15	16	17	18	19	10	11	12	13	14	15	16	14	15	16	17	18	19	20
20	21	22	23	24	25	26	17	18	19	20	21	22	23	21	22	23	24	25	26	27
27	28	29	30	31			24	25	26	27	28	29	30	28	29	30				
							31													

OCTOBER							NOVEMBER							DECEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
			1	2	3	4							1	1	2	3	4	5	6	
5	6	7	8	9	10	11	2	3	4	5	6	7	8	7	8	9	10	11	12	13
12	13	14	15	16	17	18	9	10	11	12	13	14	15	14	15	16	17	18	19	20
19	20	21	22	23	24	25	16	17	18	19	20	21	22	21	22	23	24	25	26	27
26	27	28	29	30	31		23	24	25	26	27	28	29	28	29	30	31			
							30													

1959

JANUARY							FEBRUARY							MARCH							
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	
					1	2	3	1	2	3	4	5	6	7	1	2	3	4	5	6	7
4	5	6	7	8	9	10	8	9	10	11	12	13	14	8	9	10	11	12	13	14	
11	12	13	14	15	16	17	15	16	17	18	19	20	21	15	16	17	18	19	20	21	
18	19	20	21	22	23	24	22	23	24	25	26	27	28	22	23	24	25	26	27	28	
25	26	27	28	29	30	31								29	30	31					

APRIL							MAY							JUNE						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
			1	2	3	4						1	2	1	2	3	4	5	6	
5	6	7	8	9	10	11	3	4	5	6	7	8	9	7	8	9	10	11	12	13
12	13	14	15	16	17	18	10	11	12	13	14	15	16	14	15	16	17	18	19	20
19	20	21	22	23	24	25	17	18	19	20	21	22	23	21	22	23	24	25	26	27
26	27	28	29	30			24	25	26	27	28	29	30	28	29	30				
							31													

College Calendar

1957

Fall Semester

September 19-21	Freshman placement days
September 23	Registration, 1: 30 p.m.
September 24	Classes and honors seminars begin
October 1	Meeting of the Board of Managers
November 5	Executive Committee of the Board of Managers
November 16	Mid-semester reports
November 28-30	Thanksgiving recess
December 3	Annual Meeting of the Board of Managers
December 21	Christmas recess begins, 12: 00 noon

1958

January 6	Christmas recess ends, 8: 00 a.m.
January 17	Classes and seminars end
January 18	Registration for spring semester, 9: 00 a.m.
January 20, 21	Review period for course students
January 20	Honors seminars begin for spring semester
January 22	Mid-year examinations begin
January 31	Mid-year examinations end

Spring Semester

February 3	Classes begin
February 4	Executive Committee of the Board of Managers
March 4	Executive Committee of the Board of Managers
March 22	Mid-semester reports
March 22	Spring recess begins, 12: 00 noon
March 31	Spring recess ends, 8: 00 a.m.
April 1	Meeting of the Board of Managers
May 3	Honors seminars end
May 6	Executive Committee of the Board of Managers
May 15	Written honors examinations begin
May 17	Classes end
May 19	Enrollment in classes for fall semester, 1: 30 p.m.
May 19-21	Review period for course students
May 22	Course examinations begin
May 26	Written honors examinations end
May 29-31	Oral honors examinations
May 31	Course examinations end
June 2-4	Senior comprehensive examinations
June 6	Meeting of the Board of Managers
June 7	Alumni Day
June 8	Baccalaureate Day
June 9	Commencement Day

College Calendar (Tentative)

1958

Fall Semester

September 18-20	Freshman placement days
September 22	Registration, 1: 30 p.m.
September 23	Classes and honors seminars begin
October 7	Meeting of the Board of Managers
November 4	Executive Committee of the Board of Managers
November 15	Mid-semester reports
November 27-29	Thanksgiving recess
December 2	Annual Meeting of the Board of Managers
December 20	Christmas recess begins, 5: 00 p.m.

1959

January 5	Christmas recess ends, 8: 00 a.m.
January 16	Classes and seminars end
January 17	Registration for spring semester, 1: 30 p.m.
January 19	Honors seminars begin for spring semester
January 19, 20	Review period for course students
January 21	Mid-year examinations begin
January 31	Mid-year examinations end

Spring Semester

February 2	Classes begin
February 3	Executive Committee of the Board of Managers
March 3	Executive Committee of the Board of Managers
March 21	Mid-semester reports
March 21	Spring recess begins, 12: 00 noon
March 30	Spring recess ends, 8: 00 a.m.
April 7	Meeting of the Board of Managers
May 2	Honors seminars end
May 5	Executive Committee of the Board of Managers
May 14	Written honors examinations begin
May 16	Classes end
May 18	Enrollment in classes for fall semester, 1: 30 p.m.
May 18-20	Review period for course students
May 21	Course examinations begin
May 25	Written honors examinations end
May 28-30	Oral honors examinations
May 30	Course examinations end
June 1-3	Senior comprehensive examinations
June 5	Meeting of the Board of Managers
June 6	Alumni Day
June 7	Baccalaureate Day
June 8	Commencement Day

PERSONNEL
OF
SWARTHMORE COLLEGE

The Corporation

CLAUDE C. SMITH, *President*
1617 Land Title Building, Philadelphia 10, Pa.

NORMAN H. WINDE, *Vice-President*
Ridley Creek Rd., R. D. 2, Media, Pa.

ELEANOR STABLER CLARKE, *Secretary*
Crumwald Farm, Wallingford, Pa.

JOSEPH B. SHANE, *Assistant Secretary*
Swarthmore College, Swarthmore, Pa.

E. LAWRENCE WORSTALL, *Treasurer*
Broad and Chestnut Streets, Philadelphia 1, Pa.

EDWARD K. CRATSLEY, *Assistant Treasurer*
Swarthmore College, Swarthmore, Pa.

Board of Managers

Ex officio

COURTNEY SMITH, Swarthmore College, Swarthmore, Pa.

Emeriti

RUTH POTTER ASHTON, 409 Elm Avenue, Swarthmore, Pa.
ELSIE PALMER BROWN, 1622 Twenty-ninth Street, N. W., Washington 7, D. C.
ISAAC H. CLOTHIER, JR., 801 Market Street, Philadelphia 5, Pa.
MARY LIPPINCOTT GRISCOM, 314 East Central Avenue, Moorestown, N. J.
EDITH WILSON JACKSON, 317 North Chester Road, Swarthmore, Pa.
ROBERT E. LAMB, 3429 West Indiana Avenue, Philadelphia 32, Pa.
LYDIA FOULKE TAYLOR, 23 Summit Avenue, Larchmont, N. Y.
BARCLAY WHITE, 3337 Market Street, Philadelphia 4, Pa.

Life Members

ELEANOR STABLER CLARKE, Crumwald Farm, Wallingford, Pa.
HADASSAH M. L. PARROT, 1025 Westview Street, Philadelphia 19, Pa.
CLAUDE C. SMITH, 1617 Land Title Building, Philadelphia 10, Pa.
HELEN GAWTHROP WORTH, 805 Augusta Road, Westover Hills, Wilmington 6, Del.

Term Expires December, 1957

ELISABETH HALLOWELL BARTLETT, 1922 Mount Royal Terrace, Baltimore 17, Md.
NICHOLAS KELLEY, 70 Broadway, New York 4, N. Y.
KATHRYN SONNEBORN READ, 5407 Atlantic Ave., Ventnor, N. J.
E. LAWRENCE WORSTALL, 33 Dudley Avenue, Lansdowne, Pa.
*ANNE PHILIPS BLAKE, 215 North Rd., Lindamere, Wilmington 3, Del.
*CHARLES P. LARKIN, JR., 410 Welsh Street, Chester, Pa.

* Nominated by the Alumni Association.

Term Expires December, 1958

- ISABEL JENKINS BOOTH, Jefferson House, The Strand, New Castle, Del.
RICHARD C. BOND, 1300 Market St., Philadelphia, Pa.
THEODORE WIDING, 2044 Philadelphia National Bank Building, Philadelphia 7, Pa.
ALFRED H. WILLIAMS, Federal Reserve Bank of Philadelphia, 925 Chestnut St., Philadelphia 1, Pa.
*CATHARINE W. DONNELLY, 1202 Windy Gate Road, Baltimore 4, Md.
*WILLIAM F. LEE, 5 Guernsey Road, Swarthmore, Pa.

Term Expires December, 1959

- BOYD T. BARNARD, 914 Philadelphia National Bank Building, Philadelphia 7, Pa.
GEORGE B. CLOTHIER, 1418 Packard Building, Philadelphia 2, Pa.
HILDA LANG DENWORTH, 301 Elm Ave., Swarthmore, Pa.
THOMAS B. MCCABE, Front and Market Streets, Chester, Pa.
ANNE ENGLE TAYLOR, 8240 Fairview Road, Philadelphia 17, Pa.
WILLIAM H. WARD, 630 Strath Haven Avenue, Swarthmore, Pa.
JOSEPH H. WILLITS, North Greenwich Road, Armonk, New York
*CLEMMENT M. BIDDLE, JR., 230 Oakridge Avenue, Summit, New Jersey
*ELIZABETH CARVER PRESTON, 60 Dogwood Lane, Swarthmore, Pa.

Term Expires December, 1960

- H. THOMAS HALLOWELL, JR., 1022 Meetinghouse Road, Rydal, Pa.
C. NORMAN STABLER, 230 West Forty-first Street, New York, N. Y.
HOWARD S. TURNER, 103 Lebanon Hills Drive, Pittsburgh 28, Pa.
NORMAN H. WINDE, Ridley Creek Road, R. D. 2, Media, Pa.
*ESTHER RIDPATH DELAPLAINE, 6402 West Halbert Road, Bethesda 14, Md.
*RICHARD H. McFEELY, George School, Bucks County, Pa.

COMMITTEES OF THE BOARD

The President is ex-Officio a member of Every Committee

Executive

- | | |
|------------------------|-----------------------|
| BOYD T. BARNARD | HADASSAH M. L. PARROT |
| ISABEL JENKINS BOOTH | HOWARD S. TURNER |
| ELEANOR STABLER CLARKE | THEODORE WIDING |
| HILDA LANG DENWORTH | NORMAN H. WINDE |
| THOMAS B. MCCABE | E. LAWRENCE WORSTALL |
| | HELEN GAWTHROP WORTH |

Finance

- | | |
|----------------------|------------------|
| E. LAWRENCE WORSTALL | NICHOLAS KELLEY |
| GEORGE B. CLOTHIER | THOMAS B. MCCABE |
| H. THOMAS HALLOWELL | THEODORE WIDING |

Instruction and Libraries

- | | |
|-----------------------|-----------------------|
| HELEN GAWTHROP WORTH | HADASSAH M. L. PARROT |
| ANNE PHILIPS BLAKE | HOWARD S. TURNER |
| HILDA LANG DENWORTH | THEODORE WIDING |
| CATHARINE W. DONNELLY | JOSEPH H. WILLITS |

* Nominated by the Alumni Association.

Property

NORMAN H. WINDE
BOYD T. BARNARD
ELISABETH HALLOWELL BARTLETT
ISABEL JENKINS BOOTH

ESTHER RIDPATH DELAPLAINE
CHARLES P. LARKIN, JR.
WILLIAM F. LEE
ANNE ENGLE TAYLOR

Trusts

THOMAS B. McCABE
BOYD T. BARNARD
RICHARD C. BOND

C. NORMAN STABLER
WILLIAM H. WARD
ALFRED H. WILLIAMS
E. LAWRENCE WORSTALL

Student Activities

HILDA LANG DENWORTH
CLEMENT M. BIDDLE, JR.
ISABEL JENKINS BOOTH
ELEANOR STABLER CLARKE

WILLIAM F. LEE
RICHARD H. McFEELY
ELIZABETH CARVER PRESTON
HOWARD S. TURNER
NORMAN H. WINDE

Nominating

HOWARD S. TURNER
BOYD T. BARNARD
ISABEL JENKINS BOOTH

HILDA LANG DENWORTH
THOMAS B. McCABE
HELEN GAWTHROP WORTH

Development

BOYD T. BARNARD
RICHARD C. BOND
ELEANOR STABLER CLARKE
GEORGE B. CLOTHIER

THOMAS B. McCABE
HADASSAH M. L. PARROT
HOWARD S. TURNER
WILLIAM H. WARD
JOSEPH H. WILLITS

Alumni Association Officers

1957-1959

President, CHARLES E. RICKARDS '27, 555 Hansell Road, Wynnewood, Pa.
Vice-President for Men, ROBERT H. WILSON '31, 603 Harvard Ave., Swarthmore, Pa.
Vice-President for Women, GERTRUDE JOLLS WINDE '28, Ridley Creek Rd., R.F.D. No. 2, Media, Pa.
Secretary, ANN LAPHAM FRAZER '38, 146 Scenic Road, Springfield, Pa.

Alumni Council

Zone I

TERM EXPIRES

JUNE

- 1958 F. PRESTON BUCKMAN, JR. '41, 1453 Tallyho Road, Meadowbrook, Pa.
J. EARLE EDWARDS, JR. '36, 137 Rutgers Ave., Swarthmore, Pa.
1959 CARL C. COLKET '38, 45 Rosemont Ave., Rosemont, Pa.
DONALD C. TURNER '31, Turner Construction Co., 1500 Walnut St., Philadelphia, Pa.
1960 ROBERT B. CLOTHIER '27, 101 Columbia Ave., Swarthmore, Pa.
H. MERLE MULLOY '24, Winding Lane, R. D. No. 3, Media, Pa.
PORTER R. WRAY '34, 256 Woodhaven Drive, Pittsburgh 28, Pa.
1958 MARGARET WALKER LIPPINCOTT '45, Rose Valley Road, Moylan, Pa.
ELIZABETH McCABE THIEME '27, 208 E. Rose Valley Road, Wallingford, Pa.
1959 OLIVE DEANE BAKER '28, Longfield, Ridley Park, Pa.
RUTH CLEAVER CARTER '30, 329 Owen Ave., Lansdowne, Pa.
1960 LEE WEISS FRANK '21, 1800 Pine Street, Philadelphia 3, Pa.
MARGARET L. McLAREN '49, 317 N. Chester Road, Swarthmore, Pa.
HELEN COLES WOOD '17, 36 Lakeview Drive, Morrestown, N. J.

Zone II

- 1958 WILBUR M. McFEELY '29, 117 Graham Street, Highland Park, N. J.
1959 CARROLL G. BOWEN '48, Oxford University Press, 5750 Ellis Ave., Chicago 37, Ill.
1960 ROBERT B. REDMAN '30, 111 N. Walnut Street, East Orange, N. J.
1958 GERTRUDE PAXSON SEIBERT '29, 105 Brookside Road, Darien, Conn.
1959 HARRIET P. GALLAGHER '51, 840 Floral Ave., Elizabeth 3, N. J.
1960 ELIZABETH NEWCOMB RAYNER '31, 823 Boston Post Road, Weston, Mass.

Zone III

- 1958 WALTER T. SKALLERUP, JR. '42, 1701 K Street, N.W., Washington 6, D. C.
1959 RICHARD H. MAYFIELD '43, 5317 Wriley Road, Westhaven, Washington 16, D. C.
1958 LISBETH CROWELL LIEBERMAN '45, 104 Kelvin Lane, Oak Ridge, Tenn.
1959 SALLY MACLELLAN COUNCILL '46, 510 Seneca Road, Richmond, Va.

Zone IV

- 1958 SPENCER R. KEARE '25, 1270 Linden Ave., Highland Park, Ill.
1959 C. ALFRED ZINN '25, 752 Convers Ave., Zanesville, Ohio
1958 BARBARA MOORE GARY '48, 7708 Juniper Ave., Gary 5, Indiana
1959 SUZANNE BRADLEY BUSH '47, 300 Woodland Ave., Winnetka, Ill.

Zone V

- 1960 GEORGE C. BOND '42, 1230 Wabash Street, Pasadena 3, Calif.
1960 ELIZABETH GEDDES BAKER '34, 72 Heather Drive, Atherton, Calif.

The Faculty

- COURTNEY SMITH, *President*324 Cedar Lane
 B.A., M.A., Ph.D., Harvard University.
- EDWARD K. CRATSLEY, *Vice-President (Finance), Controller, and Professor of Economics*925 Strath Haven Avenue
 B.A., College of Wooster; M.B.A. and D.C.S., Harvard University.
- JOSEPH B. SHANE, *Vice-President (Public Relations and Alumni Affairs) and Professor of Education*Cunningham House
 B.A., Swarthmore College; M.A., University of Pennsylvania.
- SUSAN P. COBBS, *Dean and Professor of Classics*West House
 B.A., Randolph-Macon Woman's College; M.A., New York University; Ph.D., University of Chicago.
- WILLIAM C. H. PRENTICE, *Dean and Professor of Psychology*1 Whittier Place
 B.A., Swarthmore College; M. A. and Ph.D., Harvard University.
- JOHN M. MOORE, *Associate Dean, Registrar and Professor of Philosophy,*
 2 Whittier Place
 B.A., Park College; B.D., Union Theological Seminary; M.A., Harvard University; Ph.D., Columbia University.
- GILMORE STOTT, *Associate Dean and Lecturer in Philosophy,*
 318 Dartmouth Avenue
 B.A. and M.A., University of Cincinnati; B.A. and M.A., Oxford University; M.A. and Ph.D., Princeton University.
- DEBORAH WING, *Associate Dean*Swarthmore College
 B.A., Swarthmore College; M.A., Radcliffe College.
- ROBERT A. BARR, JR., *Assistant Dean for Admissions*312 Cedar Lane
 B.A., Swarthmore College.

EMERITI

- LYDIA BAER, *Associate Professor Emeritus of German*Anna Maria Island, Fla.
 B.A., Oberlin College; M.A. and Ph.D., University of Pennsylvania.
- ALFRED MANSFIELD BROOKS, *Professor Emeritus of Fine Arts*Gloucester, Mass.
 B.A. and M.A., Harvard University; M.A., Indiana University.
- HENRY JERMAIN MAUDE CREIGHTON, *Professor Emeritus of Chemistry,*
 Tigh-Solas, Glen Margaret, Nova Scotia, Canada
 B.A., M.A. and LL.D., Dalhousie University; M.Sc., University of Birmingham; D.Sc., Das eidgenössische Polytechnikum, Zürich.
- PHILIP MARSHALL HICKS, *Professor Emeritus of English Literature*Avondale, Pa.
 B.A. and M.A., Swarthmore College; Ph.D., University of Pennsylvania.
- WOLFGANG KÖHLER, *Research Professor Emeritus of Philosophy and Psychology (on special research grant)*603 Elm Avenue
 Dr. Phil., University of Berlin; D.Sc., University of Pennsylvania, University of Chicago, Kenyon College.
- SAMUEL COPELAND PALMER, *Professor Emeritus of Botany*403 N. Chester Road
 B.A. and M.A., Swarthmore College; M.A. and Ph.D., Harvard University.

PROFESSORS

- MARY ALBERTSON, *Professor of History*405 Walnut Lane
 B.A., M.A., and Ph.D., Bryn Mawr College.
- SOLOMON E. ASCH, *Professor of Psychology*513 Elm Avenue
 B.S., College of the City of New York; M.A. and Ph.D., Columbia University.
- GEORGE J. BECKER, *Professor of English*401 Walnut Lane
 B.A., M.A., and Ph.D., University of Washington.
- PAUL H. BEIK, *Professor of History*4 Whittier Place
 B.A., Union College; M.A. and Ph.D., Columbia University.
- †RICHARD B. BRANDT, *Charles and Harriett Cox McDowell Professor of Philosophy,*
 521 Elm Avenue
 B.A., Denison University; B.A., University of Cambridge; Ph.D., Yale University.

† Absent on leave, spring semester, 1957-58.

- HEINRICH BRINKMANN, *Edward Hicks Magill Professor of Mathematics*,
403 Walnut Lane
B.A., Stanford University; M.A. and Ph.D., Harvard University.
- SAMUEL T. CARPENTER, *Isaiah V. Williamson Professor of Civil and Mechanical Engineering* 612 Ogden Avenue
B.C.E., C.E., and M.S., Ohio State University.
- WILLIAM J. COPE, *Professor of Mechanical Engineering* 1121 Muhlenberg Ave.
B.S. in M.E., University of Utah; M.E., Stanford University; Sc.D. in M.E., Massachusetts Institute of Technology.
- EDWARD H. COX, *Edmund Allen Professor of Chemistry* 416 Park Avenue
B.S., Earlham College; M.A., Harvard University; Docteur és Science, L'Université de Geneve; Docteur honoris causa, L'Université de Montpellier.
- ‡W. C. ELMORE, *Professor of Physics* Baltimore Pike, R. D. 3, Media
B.S., Lehigh University; Ph.D., Yale University.
- ROBERT K. ENDERS, *Isaac H. Clothier, Jr., Professor of Biology* 311 Elm Avenue
B.A. and Ph.D., University of Michigan.
- MILAN W. GARRETT, *Professor of Physics* 336 North Princeton Avenue
B.A. and M.A., Stanford University; B.A. and D. Phil., University of Oxford.
- EVERETT L. HUNT, *Professor of English and Dean Emeritus* 604 Elm Avenue
B.A., Huron College; M.A., University of Chicago; D.Litt., Huron College.
- HOWARD MALCOLM JENKINS, *Henry C. and J. Archer Turner Professor of Engineering* 506 North Chester Road
B.A. and E.E., Swarthmore College.
- WALTER B. KEIGHTON, JR., *Professor of Chemistry* 311 Cedar Lane
B.A., Swarthmore College; Ph.D., Princeton University.
- HAROLD M. MARCH, *Professor of French* 317 North Chester Road
B.A., Princeton University; Ph.D., Yale University.
- ‡JOHN D. MCCRUMM, *Professor of Electrical Engineering*,
Palmer Mill Road, R.D. 1, Media
B.S. and M.S., University of Colorado.
- J. ROLAND PENNOCK, *Professor of Political Science* 3 Whittier Place
B.A., Swarthmore College; M.A. and Ph.D., Harvard University.
- †EDITH PHILIPS, *Susan W. Lippincott Professor of French* 517 Elm Avenue
B.A., Goucher College; Docteur de l'Université de Paris.
- ‡FRANK C. PIERSON, *Professor of Economics* 740 Ogden Avenue
B.A., Swarthmore College; Ph.D., Columbia University.
- CHARLES B. SHAW, *Librarian* 606 Ogden Avenue
B.A., M.A. and L.H.D., Clark University.
- L. R. SHERO, *Professor of Greek* 651 North Chester Road
B.A., Haverford College; B.A., Oxford University; M.A. and Ph.D., University of Wisconsin.
- ALFRED J. SWAN, *Professor of Music* (on joint appointment with Haverford College)
773 College Avenue, Haverford
B.A. and M.A., Oxford University.
- FREDERICK B. TOLLES, *Howard M. Jenkins Professor of Quaker History and Research, and Director of the Friends Historical Library* 606 Elm Avenue
B.A., M.A., Ph.D., Harvard University.
- PETER VAN DE KAMP, *Professor of Astronomy and Director of Sproul Observatory*,
602 Elm Avenue
Cand. and Docts., University of Utrecht; Ph.D., University of California; D.Phil., University of Groningen.
- ROBERT M. WALKER, *Professor of Fine Arts* 212 Elm Avenue
B.A. and M.F.A., Princeton University; Ph.D., Harvard University.
- HANS WALLACH, *Professor of Psychology* 4 Crum Ledge
Dr. Phil., University of Berlin.
- CLAIR WILCOX, *Joseph Wharton Professor of Political Economy* .. 510 Ogden Avenue
B.S., University of Pennsylvania; M.A., Ohio State University; Ph.D., University of Pennsylvania.
- ‡ELIZABETH COX WRIGHT, *Professor of English* Rose Valley, Moylan
B.A., Wellesley College; M.A. and Ph.D., University of Pennsylvania.

‡ Absent on leave, 1957-58.

† Absent on leave, spring semester, 1957-58.

ASSOCIATE PROFESSORS

- DENNISON BANCROFT, *Associate Professor of Physics*733 Harvard Avenue
 B.A., Amherst College; Ph.D., Harvard University.
- MONROE C. BEARDSLEY, *Associate Professor of Philosophy*133 Rutgers Avenue
 B.A. and Ph.D., Yale University.
- PHILIP W. CARRUTH, *Associate Professor of Mathematics*515 Elm Avenue
 B.A., Hamilton College; M.A., Syracuse University; Ph.D., University of Illinois.
- HILDE D. COHN, *Associate Professor of German*302 North Chester Road
 Dr. Phil., University of Heidelberg.
- JOSEPH W. CONARD, *Associate Professor of Economics*,
 217 North Swarthmore Avenue
 B.A., Grinnell College; M.A., University of California.
- ROBERT H. DUNN, *Associate Professor of Physical Education for Men*,
 811 Westdale Avenue
 B.S., Temple University.
- LEWIS H. ELVERSON, *Associate Professor of Physical Education for Men*,
 6 Whittier Place
 B.S., University of Pennsylvania.
- E. J. FAULKNER, *Associate Professor of Physical Education for Men*,
 235 Dickinson Avenue
 EDWARD A. FEHNEL, *Associate Professor of Chemistry*600 Elm Avenue
 B.S., M.S. and Ph.D., Lehigh University.
- *JAMES A. FIELD, JR., *Associate Professor of History*612 Hillborn Avenue
 B.S., M.A. and Ph.D., Harvard University.
- LAUNCE J. FLEMISTER, JR., *Associate Professor of Zoology*,
 Rogers Lane and Plush Mill Road, Wallingford
 B.A., M.A. and Ph.D., Duke University.
- DUNCAN GRAHAM FOSTER, *Associate Professor of Chemistry*15 Crest Lane
 B.A. and M.A., Harvard University; Ph.D., Johns Hopkins University.
- HENRY GLEITMAN, *Associate Professor of Psychology*2 Crum Ledge
 B.S., College of the City of New York; Ph.D., University of California.
- GILBERT P. HAIGHT, JR., *Associate Professor of Chemistry*409 College Avenue
 B.A., Stanford University; Ph.D., Princeton University.
- FREDRIC S. KLEES, *Associate Professor of English*525 Elm Avenue
 B.A., Bowdoin College.
- ‡LAURENCE D. LAFORE, *Associate Professor of History*506 Ogden Avenue
 B.A., Swarthmore College; M.A., Ph.D., Fletcher School of Law and Diplomacy.
- LUZERN G. LIVINGSTON, *Associate Professor of Botany*,
 422 Highland Avenue, Morton
 B.S., Lawrence College; Ph.D., University of Wisconsin.
- FRANZ H. MAUTNER, *Associate Professor of German*519 Walnut Lane
 Ph.D. with distinction, Univ. of Vienna.
- ‡NORMAN A. MEINKOTH, *Associate Professor of Zoology*,
 431 West Woodland Avenue, Springfield
 B. of Ed., Southern Illinois Teachers College; M.S. and Ph.D., University of Illinois.
- IRENE MOLL, *Associate Professor of Physical Education for Women*,
 The Damsite, Wallingford
 B.S. in Ed., University of Kansas; M.A., Texas State College for Women.
- BERNARD MORRILL, *Associate Professor of Mechanical Engineering*,
 21 Oberlin Avenue
 B.S. in M.E., Massachusetts Institute of Technology; M.M.E., University of Delaware.
- HELEN F. NORTH, *Associate Professor of Classics*120 South Chester Road
 B.A., M.A., Ph.D., Cornell University.
- MAY E. PARRY, *Associate Professor of Physical Education for Women*,
 317 North Chester Road
 B.A., Swarthmore College; B.S., Temple University.

* Absent on leave, fall semester, 1957-58.

‡ Absent on leave, 1957-58.

- VIRGINIA RATH, *Associate Professor of Physical Education for Women* .735 Yale Ave.
B.A., Hollins College; M.A., Columbia University.
- HEDLEY RHYS, *Associate Professor of Fine Arts*512 Elm Avenue
B.A., West Virginia University; M.A., Ph.D., Harvard University.
- JAMES D. SORBER, *Associate Professor of Spanish*404 Walnut Lane
B.A., Lehigh University; M.A., University of Nebraska.
- WILLIS J. STETSON, *Associate Professor of Physical Education for Men and Director of Athletics*144 North Highland Road, Springfield
B.A., Swarthmore College; M.A., University of Pennsylvania.
- KENNETH N. WALTZ, *Associate Professor of Political Science*1 Crum Ledge
B.A., Oberlin College; M.A. and Ph.D., Columbia University.
- WILLIS D. WEATHERFORD, *Associate Professor of Economics*515 Elm Avenue
B.A., Vanderbilt University; B.D., Yale University; M.A. and Ph.D., Harvard University.
- NEAL A. WEBER, *Associate Professor of Zoology*West House
B.A. and M.S., University of North Dakota; M.A. and Ph.D., Harvard University.

ASSISTANT PROFESSORS

- WARREN E. ADAMS, *Assistant Professor of Economics*Swarthmore College
B.A., Ph.D., University of California, Berkeley.
- ELISA ASENSIO, *Assistant Professor of Spanish*500 Oakley Road, Haverford
M.A., Middlebury College.
- CARL BARUS, *Assistant Professor of Electrical Engineering*8 Whittier Place
B.A., Brown University; M.S. in E.E., Massachusetts Institute of Technology.
- ‡KURT K. BOHNSACK, *Assistant Professor of Biology*318 Yale Avenue
B.S., Ohio University; M.S. and Ph.D., University of Michigan.
- DAVID L. BOWLER, *Assistant Professor of Electrical Engineering*,3 Crum Ledge
B.S. in E.E., Bucknell University; M.S. in E.E., Massachusetts Institute of Technology.
- WILLIAM H. BROWN, JR., *Assistant Professor of Economics* .Crum Creek Rd., Media
B.A. and Ph.D., Yale University.
- GLORIA L. CAREY, *Assistant Professor of Psychology*805 Harvard Avenue
B.A., Western Washington College of Education; M.S., University of Washington;
Ph.D., Stanford University.
- DAVID COWDEN, *Assistant Professor of English*312 Ogden Avenue
B.A., Swarthmore College; M.A. and Ph.D., Harvard University.
- ROBERT D. CROSS, *Assistant Professor of History*915 Harvard Avenue
B.A., M.A. and Ph.D., Harvard University.
- CHARLES E. GILBERT, *Assistant Professor of Political Science*8 Crum Ledge
B.A., Haverford College; Ph.D., Northwestern University.
- FRÉDÉRIC J. GROVER, *Assistant Professor of French*6 Crum Ledge
L. és L., University of Paris; Ph.D., University of California.
- ELEANOR K. HESS, *Assistant Professor of Physical Education for Women*,
321 Davis Road, Havertown
- DANIEL G. HOFFMAN, *Assistant Professor of English*5 Crum Ledge
B.A., M.A. and Ph.D., Columbia University.
- SAMUEL L. HYNES, *Assistant Professor of English*5 Whittier Place
B.A., University of Minnesota; M.A. and Ph.D., Columbia University.
- ‡ROY F. LINSENMEYER, *Assistant Prof. of Civil Engineering*...99 Dartmouth Ave.
B.S. in C.E., University of Pittsburgh; M.S.E., University of Michigan.
- PETER MADISON, *Assistant Professor of Psychology*8B Whittier Place
B.S., University of Oregon; M. A. and Ph.D., Harvard University.
- EDGAR R. MULLINS, JR., *Assistant Professor of Mathematics* ...406 Haverford Place
B.A., Grinnell College; M.A. and Ph.D., University of Illinois.

‡ Absent on leave, 1957-58.

- CHARLES W. NEWLIN, *Assistant Professor of Civil Engineering*,
204 Sunnybrook Road, Springfield
B.C.E., Rose Polytechnic Institute; M.S., Harvard University.
- PHILIP C. PRAGER, *Assistant Professor of Mechanical Engineering*,
132 North Highland Road, Springfield
B.S. in M.E., University of Pittsburgh; M.M.E., University of Delaware.
- ‡PETER RIESENBERG, *Assistant Professor of History* 519 Walnut Lane
B.A., Rutgers University; M.A., University of Wisconsin; Ph.D., Columbia University.
- DAVID ROSEN, *Assistant Professor of Mathematics* . . . 115 President Avenue, Rutledge
B.A., New York University; M.A. and Ph.D., University of Pennsylvania.
- JUSTUS ROSENBERG, *Assistant Professor of German and Russian* . . 915 Harvard Avenue
L. és L., University of Paris; Ph.D., University of Cincinnati.
- MICHAEL J. SCRIVEN, *Assistant Professor of Philosophy* 519 Walnut Lane
B.A. and M.A., University of Melbourne; D. Phil., Oxford University.
- DAVID G. SMITH, *Assistant Professor of Political Science* Swarthmore College
B.A. and M.A., University of Oklahoma; Ph.D., Johns Hopkins University.
- PETER GRAM SWING, *Asst. Prof. of Music and Director of the Chorus* 7 Crum Ledge
B.A. and M.A., Harvard University.
- *JEANNE THEIS WHITAKER, *Assistant Professor of French* . . . 317 North Chester Road
B. A., Swarthmore College.
- MERTON JOSEPH WILLIS, *Assistant Professor of Civil Engineering*,
Copples and Calendar Lanes, Wallingford
B.C.E., University of Washington; M.S., Cornell University.
- ‡ARNE A. WYLLER, *Asst. Prof. and Research Associate in Astronomy* . . 2 Crum Ledge
Cand. Mag., Oslo University; Ph.D., Harvard University.

INSTRUCTORS

- JAMES MARTIN BROUWER, *Instructor in History* 805 Harvard Avenue
B.A. and M.A., Yale University.
- JOHN S. COOLIDGE, *Instructor in English* Moylan-Rose Valley, Pa.
B.A. and M.A., Harvard University.
- WILLIAM C. DENISON, *Instructor in Botany* 317 North Chester Road
A.B. and A.M., Oberlin College.
- TOSHIYUKI FUKUSHIMA, *Instructor in Mechanical Engineering* 519 Walnut Lane
B.S., Swarthmore College.
- HAROLD G. KLEIN, *Instructor in Biology* Swarthmore College
B.S., M.S., Cornell University.
- JACOB NACHMIAS, *Instructor in Psychology*, 302 North Chester Road
B.A., Cornell University; M.A., Swarthmore College; Ph.D., Harvard University.
- GENE DONALD OVERSTREET, *Instructor in Political Science* 102 Cornell Avenue
B.A., Reed College; M.A., Columbia University.
- JEROME A. SHAEFFER, *Instructor in Philosophy* 915 Harvard Avenue
B.A., Cornell University; Ph.D., Princeton University.
- ROBERT JAMES STONE, *Instructor in Civil Engineering*,
231 West Albarle Ave., Lansdowne, Pa.
B.S., College of William and Mary; B.S., Swarthmore College; M.S.E., University of Michigan.
- PERCY LINWOOD URBAN, JR., *Instructor in Religion* 317 North Chester Road
B.A., Princeton University; S.T.B. and S.T.M., General Theological Seminary.
- DANIEL WILLARD, *Instructor in Physics* 835 Harvard Avenue
B.S. and M.S., Yale University; Ph.D., Massachusetts Institute of Technology.
- HARRISON MORRIS WRIGHT, *Instructor in History*, Swarthmore College
B.A., M.A. and Ph.D., Harvard University.
- ALEX ZWERDLING, *Instructor in English* 835 Harvard Avenue
B.A., Cornell University; M.A., Princeton University.

‡ Absent on leave, 1957-58.

* Absent on leave, fall semester, 1957-58.

LECTURERS AND ASSISTANTS

- AVERY BLAKE, *Assistant in Physical Education for Men* 49 Amherst Avenue
 ALICE BRODHEAD, *Lecturer in Psychology and Education* 316 Ogden Avenue
 B.S. and M.A., University of Pennsylvania.
 NADIA CHILKOVSKY, *Assistant in Physical Education for Women*,
 217 S. Van Pelt St., Philadelphia
 JOHN I. CODDINGTON, *Lecturer in History* 302 North Chester Road
 B.A. and M.A., Harvard University.
 NICOLE TISSOT CROSBY, *Assistant in Modern Languages*,
 401 West Price St., Philadelphia, Pa.
 B.A., Swarthmore College.
 GOMER H. DAVIES, *Assistant in Physical Education for Men* ... Swarthmore College
 B.S., East Stroudsburg State Teachers College; Ed.M., Temple University.
 JOHN B. H. DONALDSON, *Assistant in Physical Education for Men*,
 Brookside Road, Wallingford, Pa.
 B.A. and LL.B., University of Pennsylvania.
 SARAH FLEMISTER, *Lecturer in Biology*,
 Rogers Lane and Plush Mill Rd., Wallingford
 B.A., M.A. and Ph.D., Duke University.
 LAURENCE W. FREDRICK, *Assistant in Astronomy* 805 Harvard Avenue
 B.A. and M.A., Swarthmore College.
 HELEN HALL, *Consultant in Reading and Language* 607 Hillborn Avenue
 B.A., Wellesley College; M.A., Swarthmore College; Ph.D., University of Penn-
 sylvania.
 HELEN MANNING HUNTER, *Lecturer in Economics* 5 College Circle, Haverford
 Ph.D., Radcliffe College.
 OLGA LANG, *Lecturer in Russian* Bryn Mawr College, Bryn Mawr
 Graduate, University of Moscow.
 BARBARA PEARSON LANGE, *Director of Dramatics and Lecturer in English*,
 319 Cedar Lane
 KENNETH L. LAWS, *Assistant in Physics* 203 St. Marks Sq., Philadelphia 4, Pa.
 B.S., California Institute of Technology.
 SARAH LEE LIPPINCOTT, *Research Associate in Astronomy* 510 Elm Avenue
 B.A., University of Pennsylvania; M.A., Swarthmore College.
 JAMES J. MCADOO, *Assistant in Physical Education for Men*,
 513 East Bringham St., Germantown, Pa.
 ANNA MARGUERITE MCCANN, *Lecturer in Fine Arts* .. 1342 Baltimore Pike, Media
 B.A., Wellesley College; M.A., Institute of Fine Arts, New York University.
 RICHARD MADISON, *Assistant in Physical Education for Men*,
 Cameron Drive, Sproul Estates
 B.A., Franklin and Marshall College.
 JAMES H. MILLER, *Assistant in Physical Education for Men*,
 834 Seventh Ave., Prospect Park
 J. EARL NESS, JR., *College Organist* 2034 Pine St., Philadelphia
 Mus.B., Curtis Institute of Music; A.A.G.O.
 HELEN PENNOCK, *Director of Arts and Crafts* 3 Whittier Place
 B.A., Earlham College.
 JEAN ASHMEAD PERKINS, *Lecturer in French* 8 Althea Lane, Morton, Pa.
 B.A., Swarthmore College; M.A., Columbia University.
 WILLIAM REESE, *Lecturer in Music and Director of the Orchestra*,
 Haverford College, Haverford
 B.A., Amherst College; M.A., Columbia University; Ph.D., University of Berlin.
 GREGORY VLASTOS, *Lecturer in Philosophy* 124 Random Road, Princeton, N. J.
 B.A., Robert College, Istanbul; B.D. and D.D., Chicago Theological Seminary;
 Ph.D., Harvard University.

DIVISIONS AND DEPARTMENTS

I. Division of the Humanities—HELEN F. NORTH, *Chairman*

- Classics, L. R. SHERO, *Chairman*.
English Literature, GEORGE J. BECKER, *Chairman*.
Fine Arts, ROBERT M. WALKER, *Chairman*.
History, MARY ALBERTSON, *Chairman*.
Modern Languages, EDITH PHILIPS, *Chairman*.
Music, ALFRED J. SWAN, *Chairman*.
Philosophy and Religion, RICHARD B. BRANDT, *Chairman*.
Psychology and Education, HANS WALLACH, *Chairman*.

II. Division of the Social Sciences—PAUL H. BEIK, *Chairman*

- Economics, CLAIR WILCOX, *Chairman*.
History, MARY ALBERTSON, *Chairman*.
Philosophy and Religion, RICHARD B. BRANDT, *Chairman*.
Political Science, J. ROLAND PENNOCK, *Chairman*.
Psychology and Education, HANS WALLACH, *Chairman*.

III. Division of Mathematics and the Natural Sciences—

WALTER B. KEIGHTON, JR., *Chairman*

- Astronomy, PETER VAN DE KAMP, *Chairman*.
Biology, ROBERT K. ENDERS, *Chairman*.
Chemistry, EDWARD H. COX, *Chairman*.
Electrical Engineering, HOWARD M. JENKINS, *Chairman*.
Mathematics, HEINRICH BRINKMANN, *Chairman*.
Physics, WILLIAM C. ELMORE, *Chairman*.
(DENNISON BANCROFT, *Acting Chairman*, 1957-58.)
Psychology and Education, HANS WALLACH, *Chairman*.

IV. Division of Engineering—SAMUEL T. CARPENTER, *Acting Chairman*

- Civil Engineering, SAMUEL T. CARPENTER, *Chairman*.
Electrical Engineering, HOWARD M. JENKINS, *Chairman*.
Mechanical Engineering, WILLIAM J. COPE, *Chairman*.
Chemistry, EDWARD H. COX, *Chairman*.
Mathematics, HEINRICH BRINKMANN, *Chairman*.
Physics, WILLIAM C. ELMORE, *Chairman*.
(DENNISON BANCROFT, *Acting Chairman*, 1957-58.)

STANDING COMMITTEES OF THE FACULTY

- ACADEMIC REQUIREMENTS: Moore, *Chairman*.
Becker, Carruth, Cobbs, Morrill, Prentice, Sorber.
- ADMISSIONS AND SCHOLARSHIPS (MEN): Prentice, *Chairman*.
Barr, Cobbs, Cross, Elverson, Moore, Mullins, Newlin, Shane, Stott.
- ADMISSIONS AND SCHOLARSHIPS (WOMEN): Cobbs, *Chairman*.
Barr, Conard, Cross, L. Flemister, Hynes, Prentice, Wing.
- ATHLETICS: Stetson, *Chairman*.
Brown, Cratsley, Dunn, Prager, Prentice, Rath, Shane, Willard.
- AWARDS AND PRIZES: Walker, *Chairman*.
Fukushima, Gilbert, Livingston, Orbison, Stott, Wing.
- COLLECTION: Shane, *Chairman*.
Bancroft, Gleitman, Haight, Hunt, Lange, Orbison, Scriven, Swing.
- COOPER FOUNDATION: Weatherford, *Chairman*.
Beardsley, Gilbert, Hynes, Mautner, Prager, Rhys, Shane, Swan, Swing.
- CURRICULUM: Brinkmann, *Chairman*.
Albertson, Beardsley, Brown, Cobbs, Fehnel, Hynes, Moore, Morrill, Prentice.
- DISTINCTION IN THE COURSE PROGRAM: Moore, *Chairman*.
Barus, Cohn, Garrett, Pennock.
- SWARTHMORE FELLOWSHIPS: Keighton, *Chairman*.
Asensio, Shaffer, Shero, D. Smith, Walker, Willis.
- FELLOWSHIPS FROM OTHER INSTITUTIONS: Mullins, *Chairman*.
Cope, Haight, Klees, Orbison, Stott, Weatherford, Wing.
- INSTRUCTION: Smith, *Chairman*.
Beik, Carpenter, Cobbs, Jenkins, Keighton, Moore, North, Pennock, Prentice, Wilcox.
- LIBRARY: North, *Chairman*.
Asch, Grover, Klees, Mautner, Shaw, Tolles, Weber, Willis.
- MASTER OF ARTS: Tolles, *Chairman*.
Bancroft, Carpenter, Fehnel, Shero, Wallach.
- PRE-MEDICAL PROGRAM: Madison, *Chairman*.
Bowie, Denison, L. Flemister, Foster, Sorber, Stott.
- RESEARCH: March, *Chairman*.
Barus, Cratsley, Enders, Pennock, van de Kamp, Wallach.
- SCHEDULE OF CLASSES: Moore, *Chairman*.
Cowden, Foster, Newlin, Rath, Rosen.
- STUDENT AFFAIRS: Prentice, *Chairman*.
Barr, Beik, Cobbs, Conard, Cross, Moll, Rosenberg, Stott, Wing.
- TRAVEL ALLOWANCE: Garrett, *Chairman*.
Cohn, Cope, Cowden, Weber.
- USE OF COLLEGE FACILITIES BY OUTSIDE ORGANIZATIONS: Stetson, *Chairman*.
Cook, Horn, Little, Prager, Rath, Shane, Wood.
- WASHINGTON SEMESTER PROGRAM: Pennock, *Chairman*.
Albertson, Conard, Gilbert.
- SECRETARY TO THE FACULTY: Jenkins.

Administrative Officers and Assistants

PRESIDENT'S OFFICE

President, COURTNEY SMITH, B.A., M.A., and Ph.D., Harvard University.

Assistant to the President, PROSSER GIFFORD, B.A., Yale University; B.A., Oxford University; LL.B., Harvard University.

Secretary, BARBARA L. CALKINS, B.A., Middlebury College.

VICE-PRESIDENTS' OFFICE

Vice-President—(Finance) and Controller, EDWARD K. CRATSLY.

B.A., College of Wooster; M.B.A. and D.C.S., Harvard University.

Vice-President—Public Relations and Alumni Affairs, JOSEPH B. SHANE.

B.A., Swarthmore College; M.A., University of Pennsylvania.

Secretaries, DORIS MUSGRAVE, MILDRED A. SCOTT.

DEANS' OFFICES

Deans:

SUSAN P. COBBS, B.A., Randolph-Macon Woman's College; M.A., New York University; Ph.D., University of Chicago.

WILLIAM C. H. PRENTICE, B.A., Swarthmore College; M.A. and Ph.D., Harvard University.

Associate Deans:

JOHN M. MOORE, B.A., Park College; B.D., Union Theological Seminary; M.A., Harvard University; Ph.D., Columbia University.

GILMORE STOTT, B.A. and M.A., University of Cincinnati; B.A. and M.A., Oxford University; M.A. and Ph.D., Princeton University.

DEBORAH WING, B.A., Swarthmore College; M.A., Radcliffe College.

Assistant Dean for Admissions:

ROBERT A. BARR, JR., B.A., Swarthmore College.

Administrative Assistant:

MARGARET W. MOORE, B.A., Park College; M.A., Ph.D., Columbia University.

Consultant in Reading and Language:

HELEN HALL, B.A., Wellesley College; M.A., Swarthmore College; Ph.D., University of Pennsylvania.

Head Residents in Dormitories:

VIRGINIA VON FRANKENBERG, Parrish Hall; B.A., University of Nebraska.

SARA M. LITTLE, Worth Dormitory; B.A., Smith College.

HELEN NORTH, Palmer Hall; B.A., M.A., Ph.D., Cornell University.

HELEN C. BOWIE, Pittenger Hall; B.A., University of Colorado.

NATALIE E. BREWER, Roberts Hall; B.A., University of Pennsylvania.

DEBORAH WING, Robinson House; B.A., Swarthmore College; M.A., Radcliffe College.

MARTHA P. SHANE, Woolman House; B.A., Swarthmore College.

Secretaries to the Deans:

EMILY BONSALE.

ALICE DANA HABERLE.

MYRTLE R. KEENE, B.A., Dickinson College.

FRANCES WILLS SLAUGH, B.A., Swarthmore College.

REGISTRAR'S OFFICE

Registrar, JOHN M. MOORE, B.A., Park College; B.D., Union Theological Seminary; M.A., Harvard University; Ph.D., Columbia University.

Secretaries, MARJORIE L. WEBB, B.A., University of Delaware.

ROSAMOND W. GARRETT, B.A., Wilson College.

LIBRARY STAFF

College Library

Librarian: CHARLES B. SHAW, B.A., M.A., and L.H.D., Clark University.

Technical Services Librarian: MARTHA A. CONNOR, B.S., M.A., University of Pennsylvania; B.S. in L.S., Drexel Institute.

Assistant Librarians:

Cataloging: ELIZABETH L. HARRAR, B.A., University of Delaware; M.A., University of Pennsylvania; B.S. in L.S., Drexel Institute.

ELIZABETH S. SHARPLESS, B.A., Swarthmore College; B.S. in L.S., Drexel Institute.

Order: SARA L. MORELAND, B.A., University of California at Los Angeles; B.S. in L.S., Carnegie Institute of Technology.

Assistants: MARY C. KERBAUGH, B.A., University of Pennsylvania; GAIL C. TICKNOR, B.Mus., Boston Conservatory of Music.

Readers Services Librarian: HOWARD H. WILLIAMS, B.A., Lake Forest College; M.A., and B.S. in L.S., Columbia University.

Assistant Librarians:

Circulation: DORIS BEIK, B.A., and B.S. in L.S., New York State College for Teachers.

Periodicals: MARY G. TAIT, B.A., Wells College; B.S. in L.S., Drexel Institute.

Assistants: JOSEPHINE SMITH, B.A., Swarthmore College; ANNE PERKINS, University of Delaware; VIRGINIA VON FRANKENBERG, B.A., University of Nebraska; HARRIET B. COFIELD, B.A., University of Pennsylvania.

Friends Historical Library

Director: FREDERICK B. TOLLES, B.A., M.A., and Ph.D., Harvard University.

Reference Librarian: DOROTHY G. HARRIS, B.A., Wellesley College; B.S. in L.S., Drexel Institute; M.A., University of Pennsylvania.

Secretarial Assistant: MARGERY JONES, B.A., Swarthmore College.

Cataloger: MILDRED HIRSCH, B.S. in L.S., Columbia University.

Swarthmore College Peace Collection:

Curator: MARY G. CARY, B.A., Bryn Mawr College; M.A., University of Pennsylvania; B.S. in L.S., Drexel Institute.

Assistant: HENRIETTA BRUCE, B.A., M.A., University of Oregon.

Honorary Curators of the Friends Historical Library

CLEMENT M. BIDDLE	.....	New York, N. Y.
ANNA PETTIT BROOMELL	.....	Philadelphia, Pa.
HENRY J. CADBURY	.....	Haverford, Pa.
ANNA GRISCOM ELKINTON	.....	Swarthmore, Pa.
LAVERNE FORBUSH	.....	Baltimore, Md.
LUCRETIA FRANKLIN	.....	McNabb, Ill.
JAMES R. FRORER	.....	Wilmington, Del.
WILLIAM HUBBEN	.....	Philadelphia, Pa.
HANNAH CLOTHIER HULL	.....	Swarthmore, Pa.
CAROLINE BIDDLE MALIN	.....	New York, N. Y.
GERALD McDONALD	.....	New York, N. Y.
RICHMOND P. MILLER	.....	Philadelphia, Pa.
HADASSAH M. L. PARROT	.....	Philadelphia, Pa.
EDITH VERLENDEN PASCHALL	.....	Lansdowne, Pa.
C. MARSHALL TAYLOR	.....	New York, N. Y.

Advisory Council of the Swarthmore College Peace Collection

Courtney Smith, *Chairman*; Irwin Abrams, Clement M. Biddle, Anna Cox Brinton, Merle Curti, Emily Cooper Johnson, John W. Nason, Ray Newton, Ernst Posner, Joseph B. Shane, Charles B. Shaw, Frederick B. Tolles, E. Raymond Wilson.

BUSINESS OFFICE

Assistant Controller, Accounting and Finance, G. CAROLINE SHERO, B.A., Swarthmore College; M.B.A., University of Pennsylvania.
Assistants, MYRA J. BELL, GERTRUDE M. GEROULD, EDITH H. LIDDELL, MARIE-LOUISE PECK, RAY P. SHOCH.
Assistant Controller, Operations, PHILIP C. PRAGER, B.S. in M.E., University of Pittsburgh; M.M.E., University of Delaware.
Purchasing Agent, LEWIS T. COOK, JR., B.A., St. Lawrence University; M.S., Pennsylvania State College.
Secretary, MARTHA H. DECROUEZ, B.S., University of Minnesota.
Manager of Bookstore, JEAN M. SORBER, *Assistant*; KATHRYN C. BENNETT.
Stenographic Staff, MARIAN M. RANSBURG, MARGUERITE CLIFFORD, OLGA A. HUMMER.
Switchboard Operators, JEAN W. CORNELIUS, AYME GOSMAN, EDNA CORSON.

HOUSE DIRECTOR'S OFFICE

House Director, SARA M. LITTLE, B.A., Smith College.
Assistants to the House Director, KATHRYN A. DAVISSON, JANET D. VEEDER, JESSIE C. GIBSON.

SUPERINTENDENT'S OFFICE

Superintendent of Buildings and Grounds, HARRY WOOD.
Director of Arthur Hoyt Scott Horticultural Foundation, JOHN C. WISTER, B.A., Harvard University; D.Sc., Swarthmore College.
Consulting Engineer, ANDREW SIMPSON, B.A., Swarthmore College; M.S., Cornell University.
Assistants to the Superintendent, CLIFFORD RENSHAW, SR., RICHARDSON FIELDS, CLIFFORD RENSHAW, JR.
Secretaries, VERONICA SULLIVAN, FRANCIS KAVANAGH.

DIETITIAN'S OFFICE

Dietitian, RUTH S. HORN.
Assistant Dietitian, BILLIE J. BURNETT.

ALUMNI AND FUND OFFICES

Director, KATHRYN BASSETT.
Alumni Recorder, MARY PALMER LICHTENBERG, B.A., Swarthmore College.
Secretaries, HELENE M. DAVIS, ELNORA COX SWARTZ.

NEWS OFFICE—VOCATIONAL GUIDANCE AND PLACEMENT

Director, MARALYN ORBISON, B.A., Swarthmore College.
Secretary, MILDRED STRAIN.

HEALTH SERVICE

Physician, MORRIS A. BOWIE, B.A., University of Colorado; M.D., Harvard University. Diplomate, American Board of Internal Medicine.
Consulting Psychiatrists:
LEON J. SAUL, B.A. and M.A., Columbia University; M.D., Harvard University.
J. W. LYONS, B.A., University of Scranton; M.D., University of Pennsylvania. Diplomates, American Board of Psychiatry and Neurology (P).

Nurses:

MARY McCULLOUGH, R.N. E. ELIZABETH McGEARY, R.N., ELSE SHAW.

INTRODUCTION
TO
SWARTHMORE COLLEGE

Introduction to Swarthmore College

Swarthmore College, founded in 1864 by members of the Religious Society of Friends, is a small co-educational college situated eleven miles southwest of Philadelphia. In accordance with the traditions of its Quaker background, Swarthmore students are expected to prepare themselves for full, well-rounded lives as individuals and as responsible citizens through exacting intellectual study supplemented by a varied program of sports and extra-curricular activities.

The college campus contains about 300 acres of rolling wooded land in the borough of Swarthmore in Delaware County, Pennsylvania. The borough of Swarthmore is a small residential suburb within half an hour's commuting distance of Philadelphia on the West Chester branch of the Pennsylvania Railroad. Situated near the intersection of U. S. Route 1 (Baltimore Pike) and Pennsylvania State Highway 320, Swarthmore is easily accessible by car.* Because of its location, Swarthmore College students are able to combine the advantages of a semi-rural setting with the opportunities offered by Philadelphia. Especially valuable is the cooperation made possible with three other nearby institutions, Bryn Mawr and Haverford Colleges and the University of Pennsylvania.

OBJECTIVES AND PURPOSES

The purpose of Swarthmore College is to make its students more valuable human beings and more useful members of society. It shares this purpose with other educational institutions, for American education is a direct outgrowth of our democratic principles. Democracy is based on the infinite worth of each individual. It can operate successfully only when men are willing to seek together a common good. It depends upon knowledge and understanding of the complex problems of modern society. The debt of our educational system to democracy is equalled only by the debt of democracy to education.

While a common purpose underlies all American education, each school and college and university seeks to realize that purpose in its own way. Each must select those tasks it can do best. Only in this way can it be most effective. Only by such selection can it contribute to the diversity and richness of educational opportunity which is a part of the American heritage and the American strength.

THE RELIGIOUS TRADITION

Swarthmore College was founded by the Religious Society of Friends and it seeks to illuminate the life of its students with the spiritual principles of

* To reach the college, motorists should turn off U. S. Route 1 to State Highway 320 in the direction of Chester and continue south along Chester Road in the borough of Swarthmore about half a mile reaching College Avenue. There a right turn is made to the college campus.

that Society. Although it has been non-sectarian in control since the beginning of the present century and although the children of Friends are in a minority, the college seeks to preserve the religious traditions out of which it sprang.

The essence of Quakerism is the individual's responsibility for seeking truth and for applying whatever truth he believes he has found. As a way of life, it emphasizes hard work, simple living, and generous giving; personal integrity, social justice, and the peaceful settlement of disputes. The college does not seek to impose on its students this Quaker view of life, or any other specific set of convictions about the nature of things and the duty of man. It does, however, have the two-fold aim of encouraging conscious concern about such questions and unceasing re-examination of any view which may be held regarding them. That is the kind of ethical and religious character which Swarthmore seeks to develop.

THE COMMUNITY LIFE

Swarthmore is a small college by deliberate policy. Its enrollment in normal years is about 900 students, of whom 425 are women and 475 are men. It is semi-rural in location, residential and co-educational in character. These features create an ideal environment for personal growth. Co-education provides the most natural environment for both men and women, who in their common work and play come to value each other for their true worth. Almost all of the students live in the college dormitories and eat together in the dining room. A large number of faculty houses are within campus boundaries, making it possible for students to have valuable social contacts with their professors outside the classroom. The residential character is the basis for a community life in which the ideals of the college influence every member. Growth in emotional maturity, necessary both for personal satisfaction and for effective action, is an integral part of the total educational program.

For this reason the college encourages a wide variety of extra-curricular activities. Participation in sports has many values, social as well as individual. Membership in student organizations is important. In practising parliamentary procedure and in facing the victories and defeats of elective office, students learn to live together, ironing out the clash of personalities and the friction of different views. They learn the effectiveness of enthusiasm and the frustration of indifference. They learn to soften their uncritical intolerance as they struggle to live successfully together. They learn the meaning of responsibility as they become responsible for their activities.

THE EDUCATIONAL PROGRAM

Swarthmore's educational program is based on the philosophy that self-discovery and self-development are more valuable than the simple demon-

strative method of teaching. Therefore, whenever it is possible, students are encouraged to make their own analyses, based on original source material or on laboratory experiments.

Believing also that a liberal education is based on knowledge of many areas of human experience, the college requires that freshmen and sophomores take a wide variety of courses. This plan allows them to test their ability in subjects they have already studied and to explore new fields. By the end of their sophomore year, students are expected to make two decisions: first, what their field of concentration will be for the last two years; and second, whether they prefer to take "Honors work" or to continue their study in regular courses.

Honors work, more fully described on pages 58 to 60, is a method of study open to juniors and seniors who have shown independence and responsibility in their academic work. They are freed from classroom routine and meet with their instructors in small weekly seminar groups for discussion and evaluation of their work. Since an honors student pursues only one major and one related minor subject during a semester, this system facilitates greater concentration and greater independence than is possible under the usual academic routine. The development of the "honors" or seminar method was begun under President Aydelotte in 1922, and because of its success, it has been widely imitated in other institutions.

ACADEMIC COMPETENCE

Democracy demands a broad base of intelligent understanding of issues. It also necessitates a high order of excellence in those who are destined to become its leaders. Swarthmore can best serve society by the maintenance of high standards. It is peculiarly fitted by tradition and performance for this essential role, and it is precisely this readiness to do a particular job well that gives the College its value in the educational mosaic of American democracy.

Education is largely an individual matter, for no two students are exactly alike. Some need detailed help, while others profit from considerable freedom. The program of Honors study, in which Swarthmore pioneered, is designed to give recognition to this fact. It is the most distinctive feature of our educational program. For many students it provides an enriching and exciting intellectual experience. It has as its main ingredients freedom from class work, maximum latitude for the development of individual responsibility, concentrated work in broad fields of study, and close association with faculty members in small seminars. The Honors program and the Course program are parallel systems of instruction for students during their last two years. Both are designed to evoke the maximum effort and development from each student, the choice of method being determined by individual need and capacity.

A college is never static. Its purposes and policies are always changing to meet new demands and new conditions. The founders of Swarthmore would find in it today many features they never contemplated when they shaped the College in the middle of the nineteenth century. Swarthmore, if it is to remain alive, must be forever changing. And many people are continually engaged in shaping its destiny—the Board of Managers, administration, faculty, students, alumni, parents, and the community as a whole. The goal is to achieve for each generation, by means appropriate to the times, that unique contribution and that standard of excellence which have been the guiding ideals of Swarthmore from its founding.

Admission

Inquiries concerning admission and applications should be addressed to the following: from men, to Gilmore Stott, Associate Dean; from women, to Deborah Wing, Associate Dean.

GENERAL STATEMENT

In the selection of students the college seeks those qualities of character, social responsibility, and intellectual capacity which it is primarily concerned to develop. It seeks them, not in isolation, but as essential elements in the whose personality of candidates for admission.

In the competition for admission preference is given to the children of Friends and alumni who can meet the requirements. It is also the policy of the college to have the student body represent not only different parts of the United States but many foreign countries, both public and private secondary schools, and various economic, social, religious, and racial groups.

Selection is important and difficult. No simple formula will be effective. The task is to select those who give real promise of distinction in the quality of their personal lives, in service to the community, or in leadership in their chosen fields. Swarthmore College must choose its students on the basis of their individual future worth to society and of their collective realization of the purpose of the college.

Admission to the freshman class is normally based upon the satisfactory completion of a four-year program preparatory to advanced liberal study. Applicants are selected on the following evidence:

1. Record in secondary school;
2. Recommendation of the school principal or headmaster and of others who know the applicant;
3. Ratings in the Scholastic Aptitude Test and in three Achievement Tests of the College Entrance Examination Board. In some cases, special tests may be given by the college.
4. Personal interview with one of the Deans or an appointed representative;
5. Reading and experience, both in school and out.

Applicants must have satisfactory standing in school, and in aptitude and achievement tests, and should show strong intellectual interests. They should also give evidence of sturdiness of character, promise of growth, initiative, seriousness of purpose, and a sense of social responsibility. As future members of the college community, they should represent varied interests, types, and backgrounds.

PREPARATION

Applicants are urged to make their choice of college as early as possible in order to plan the work of their school years with the assistance of the Committees on Admission. In general, preparation should include:

1. *Skills*: The following skills are essential to success in college work and should be brought to a high level by study and practice throughout the preparatory period:
 - a. The use of the English language with accuracy and effectiveness in reading, writing, and speaking.
 - b. The use of the principles of arithmetic, algebra, and plane geometry.
 - c. The use of one, or preferably of two, foreign languages to the point of reading prose of average difficulty at sight, and of writing and speaking with some ease and proficiency.
2. *Subjects*: All, or almost all, of the preparatory course should be composed of the subjects listed in the following four groups. Variations of choice and emphasis are acceptable although some work should be taken in each group.

History and Social Studies: American, English, European, and ancient history; political, social, and economic problems of modern society.

Literature and Art: American, English, and foreign literature, ancient and modern; music, art, architecture.

Natural Science and Mathematics: chemistry, physics, biology, astronomy; algebra, geometry, trigonometry. A college major in science or engineering presupposes substantial work in algebra, in plane and, if possible, solid geometry, and in trigonometry.

Languages: English, Latin, Greek, German, French, Spanish, other European or Oriental languages. Applicants who expect to major in science are strongly advised to include German and, if possible, French in their school programs.

APPLICATIONS AND EXAMINATIONS

Applications must be filed in the office of the Deans by February 15 of the year in which the candidate wishes to be admitted. An application fee of \$10.00, which is not refundable, is required of all candidates.

All applicants for admission are required to take the Scholastic Aptitude Test and three Achievement Tests given by the College Entrance Examination Board.

The Achievement Test in English Composition is required of all candidates; the other two Achievement Tests are chosen by the candidate from

two different fields. Candidates for engineering must take the test in Advanced Mathematics.

In 1957-58 these tests will be given in various centers throughout this country and abroad on December 7, January 11, February 8, March 15, May 17 and August 13. Applicants are normally expected to take three Achievement Tests in March of their senior year. They may take the Scholastic Aptitude Test in December, January, February or March. Scholarship candidates are urged to take the Aptitude Test in December or January. Those who wish to take the tests *for practice* at the end of the Junior year are encouraged to do so. All such applicants must repeat the tests in their Senior year, however, in order to give themselves the advantage of maximum preparation.

Application to take the test should be made directly to the College Entrance Examination Board, Box 592, Princeton, New Jersey. A bulletin of information may be obtained without charge from the Board. Students who wish to take the test in any of the following western states, territories, and Pacific areas, Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming, Alaska, Hawaii, Alberta, British Columbia, Manitoba, Saskatchewan, Mexico, Australia, and all Pacific Islands including Formosa and Japan, should address their inquiries and send their applications to the College Entrance Examination Board, Box 27896, Los Angeles 27, California. Application should be made to the Board at least a month before the date on which the test will be taken.

No additional tests are required of candidates for scholarships. They must, however, write for a special application blank at least two weeks in advance of the date on which applications for admission are due. Information concerning scholarships will be found on pages 33 to 41.

Notices of the action of the Admissions Committee will be mailed about May 1.

ADVANCED STANDING

For favorable consideration, applicants for advanced standing must have had a good scholastic record in the institution from which they wish to transfer, and must present full credentials for both college and preparatory work and a letter of honorable dismissal. They must take the Scholastic Aptitude Test given by the College Entrance Examination Board if this test has not been taken previously.

As a general rule, students are not admitted to advanced standing later than the beginning of the sophomore year. Four terms of study at Swarthmore College constitute the minimum requirement for a degree, two of which must be those of the senior year.

Freshmen may apply for advanced standing or placement in particular courses if they have taken college level courses in approved schools and the Advanced Placement Tests of the College Entrance Examination Board.

Expenses

Charges per academic year of two semesters:

Board, room, and tuition	\$1,725*
General fee	125
	<hr/>
Total charges	\$1,850

While a general charge for board, room and tuition is made, this may be divided into \$1000 for tuition and \$725 for board and room. The general fee of \$125 per year covers the costs of student health, library and laboratory fees, athletic fees, arts and crafts, and the support of several other extra curricular activities.

An additional deposit of \$25 per semester is required of each student, payable in advance, to cover incidental bills. Students may charge purchases at the college bookstore, and certain other charges agreed to by the Business Office. When this deposit has been exhausted a new one will be required immediately. Any unused balance is returned at the time of graduating or leaving college.

One half of the total sum is due not later than Registration Day at the beginning of the fall semester. Bills are mailed before the opening of the current term. Payments should be made by check or draft to the order of SWARTHMORE COLLEGE. A student is not a registered student at Swarthmore College, nor on any class roll, until his bill is paid. Correspondence about financial matters should be addressed to Miss G. Caroline Shero, Assistant Controller.

No reduction or refunding of tuition can be made on account of absence illness, voluntary withdrawal, or dismissal from college. No reduction or refund will be made for failure to occupy the room assigned for a given term, nor is the general fee refundable. In case of absence or withdrawal from the college and provided due notice has been given in advance to the Business Office, there will be a refund of two-thirds of the board charge for any time in excess of two weeks. Exceptions will be made for students who are required by the draft to leave during the course of the academic year. In these cases tuition, general fee, board and room charges will be refunded on a pro rata basis.

THE TUITION PLAN

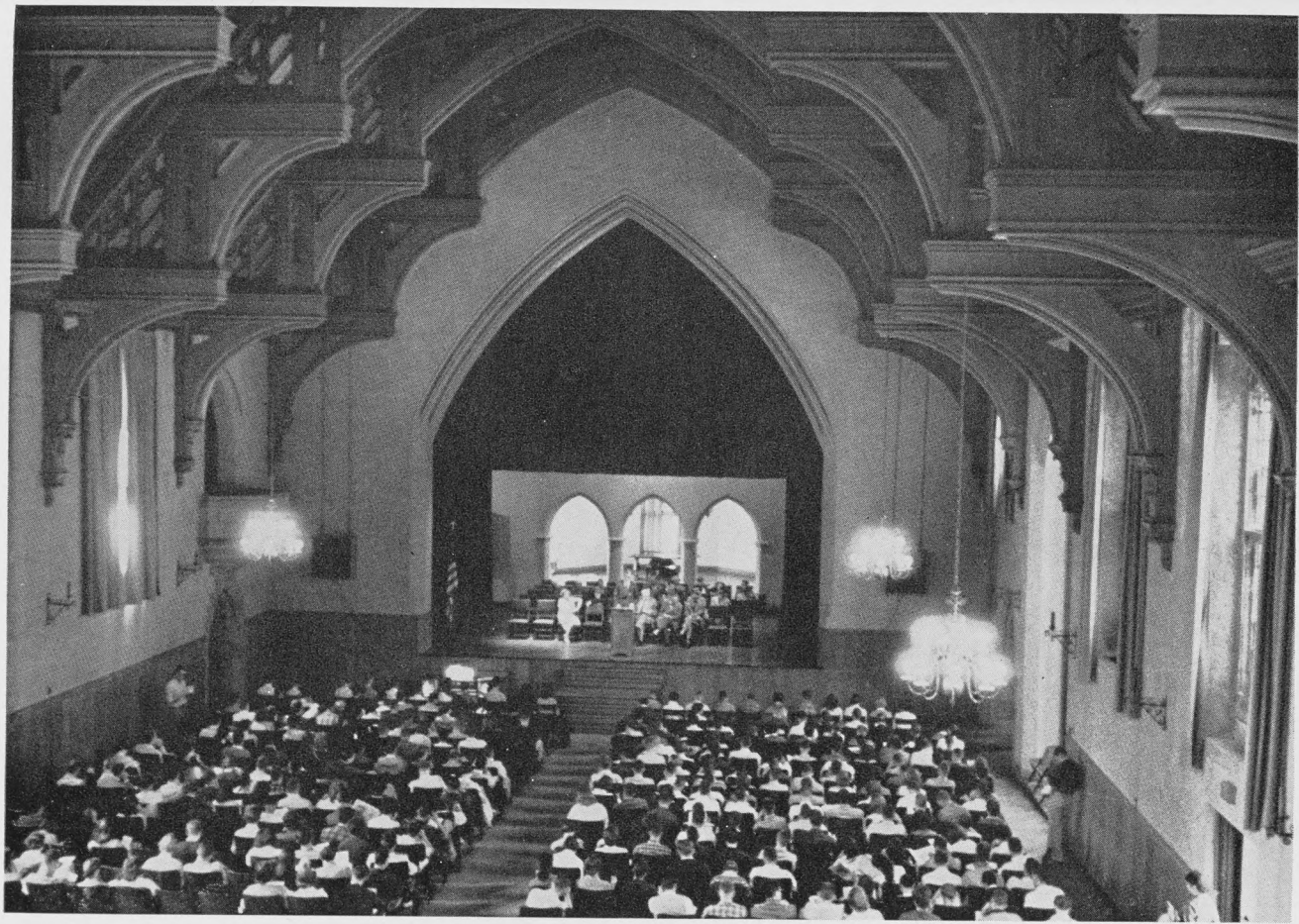
Many of the parents of students may wish to pay all tuition, fees, and residence charges on a monthly basis. It is possible to arrange this under

* An advance deposit of \$25 is required of all new students in order to reserve a place in college for the coming year. A similar deposit of \$15 is required of returning students. These deposits are credited against the bill for tuition, board, and room.

The Tuition Plan. The cost is four percent greater than when payments are made in cash in advance. Details of its operation will be furnished by the College with the first semester's bill in September.

ACCIDENT AND SICKNESS INSURANCE

The college makes available both accident and accident and sickness insurance to students through John C. Paige & Company of Boston, Massachusetts. Accident coverage alone costs \$5.00 per year (12 months) for women, and \$10.00 for men. The combined accident and sickness policy is available at an annual cost of \$18.00 for women and \$22.00 for men. At least accident coverage is required of all students who participate in intercollegiate athletic activities and the combined accident and sickness policy is particularly recommended. Application forms are mailed to all students during the summer.



Interior, Clothier Memorial



Scholarships and Student Aid

The college awards scholarships to a substantial number of students each year. These awards are normally made to entering freshman students and are renewable for four years. About sixty-five such scholarships are awarded each year, carrying stipends varying from \$200 to \$1500 annually. Seventeen freshman scholarships, three of which are designated for students in the field of engineering, provide stipends up to a maximum figure of \$1500. The average stipend is at present in the neighborhood of \$700 annually. All awards are based upon school or college record, and upon the financial need of the family as revealed in confidential statements to the Scholarship Committee through the agency of the College Scholarship Service.

Candidates wishing to apply for scholarships should make the usual application for admission. All applicants for admission are given the opportunity to apply for scholarship aid. The candidate's status with respect to need for scholarship is not considered to be a relevant factor in the matter of reaching decisions concerning admission to the college.

During the current academic year the college has granted approximately \$175,000 in scholarships. About one-third of that sum is provided by special gifts and the endowed scholarships listed below. The income from many of these endowments is assigned each year to entering freshmen in accordance with the will of the donor and in his name.

GRANTS-IN-AID, to a limited number, may be awarded to students with financial need and average scholastic standing who could not earn all they need without serious detriment to their academic work.

COLLEGE EMPLOYMENT affords opportunity to earn money by regular work at current wage rates in one of the college offices, shops, laboratories or libraries. A student may hold a college job in addition to a scholarship or a grant-in-aid. The distribution of jobs among those authorized to hold them is made by the Student Employment office. Residents of the borough of Swarthmore often send requests for services to the college, which cooperates in making these opportunities known to students. Last year over four hundred students secured work through the office. Many students earn from eight to ten dollars a week and still maintain an excellent scholastic standing.

SCHOLARSHIPS FOR MEN

The GEORGE F. BAKER SCHOLARSHIPS. The George F. Baker Scholarships, awarded for the first time in 1950, have been given to the college as part of a national scholarship program. They are the gift of the George F. Baker Foundation and will be awarded to four freshman men each year. The actual amount of the scholarships, in part determined by financial need, will be a maximum of \$1,500 for each year of the student's college career. Students will be chosen for these awards primarily on the basis of achievement and promise of leadership in business, government and the professions.

OPEN SCHOLARSHIPS FOR MEN. Swarthmore College awards annually five four-year scholarships to men entering the freshman class. These

scholarships, based on the general plan of the Rhodes Scholarships, are given to candidates who, in the opinion of the Committee of Award, rank highest in scholarship, character and personality. The amount of the annual award varies from \$200 to \$1500 according to the financial need of the winner.

The THOMAS B. McCABE ACHIEVEMENT AWARD, established by Thomas B. McCabe '15, provides an annual grant of \$1,200 open to entering freshman men. Applicants must be residents of Delaware or the Eastern Shore counties of Maryland or Virginia. Selection will be based on achievements which give promise of leadership, and emphasis will be placed on ability, character, personality, and service to school and community.

The SCOTT AWARD AT SWARTHMORE. A scholarship established by the Scott Paper Co. of Chester, Pa., in honor of its former president, Arthur Hoyt Scott of the Class of 1895. Given for the first time in 1953, it will be awarded annually for the next five years to an outstanding sophomore who plans to enter business after graduation and who demonstrates the qualities of scholarship, character, personality, leadership, and physical vigor. The award provides the recipient with \$1,000 for each of his last two years in college.

The SCOTT B. LILLY SCHOLARSHIP, endowed by Jacob T. Schless of the Class of 1914 at Swarthmore College, was offered for the first time in 1950. This scholarship is in honor of a former distinguished Professor of Engineering and, therefore, students who plan to major in engineering will be given preference. The stipend will be a maximum of \$1,500 a year for four years; the exact amount of the award will be determined by the financial needs of the winning applicant.

The PHILIP T. SHARPLES SCHOLARSHIP, a four-year scholarship open to entering freshmen, is designed to honor and encourage young men in engineering or physical science. The committee, in making its selections, will have regard for candidates who rank highest in scholarship, character, personality, leadership, and physical vigor. At least one scholarship will be given each year with a maximum grant of \$1,500. The actual amount of the stipend will be determined by the financial need of the candidate.

The EDWARD R. ARMSTRONG MEMORIAL SCHOLARSHIP is awarded annually to a young man preparing himself to become an engineer and who is in need of financial assistance. The Committee in making its selections in consultation with Professor Samuel T. Carpenter, will have high regard for candidates who rank highest in scholarship, character, personality, leadership, and physical vigor. The scholarship provides a maximum of \$1,500 a year.

The AARON B. IVINS SCHOLARSHIP is awarded annually to a young man of the graduating class of Friends Central School, Overbrook, Philadelphia. It is awarded under the following conditions. The recipient must have been

a student at Friends Central for at least two years, he must have good health, high grades, and must be the best all-around student in his class desirous of entering Swarthmore College. This scholarship, awarded by the faculty of Friends Central School, and subject to the approval of Swarthmore College, has a maximum value of \$650.

The HOWARD COOPER JOHNSON SCHOLARSHIP, established by Howard Cooper Johnson '96, provides approximately \$500 a year. It is awarded on the basis of all-around achievement to a male undergraduate who is a member of the Society of Friends.

The T. H. DUDLEY PERKINS MEMORIAL SCHOLARSHIP is awarded annually to an entering freshman on the basis of qualities of manhood, force of character and leadership; literary and scholastic ability; physical vigor as shown by participation in out-of-doors sports or in other ways. It has a maximum value of \$500.

The MILLER-FLOUNDERS SCHOLARSHIP of \$500 per year is awarded to a freshman man who resides in and has attended school in Delaware County, Pennsylvania. To be eligible for the award the student must have clearly demonstrated leadership in scholastic achievement and in extra-curricular activities during his high school program. The scholarship is usually awarded in alternate years and is renewable provided a satisfactory record is maintained.

The WILLIAM G. AND MARY N. SERRILL HONORS SCHOLARSHIP is a competitive Scholarship for Men, awarded to a candidate for admission to the college, based upon the general plan of the Rhodes Scholarships. The annual stipend is \$375. Preference will be given to men who are residents of Abington Township, including Jenkintown and Glenside, Montgomery County, Pa., but if there is no outstanding candidate from this locality, the scholarship will be open to competition generally.

The SARAH KAIGHN COOPER SCHOLARSHIP, founded by Sallie K. Johnson in memory of her grandparents, Sarah Kaighn and Sarah Cooper, is awarded to a man in the Junior Class who is judged by the faculty to have had, since entering College, the best record for scholarship, character, and influence. The value of this scholarship is approximately \$225 annually.

The DONALD RENWICK FERGUSON SCHOLARSHIP, established by Mrs. Amy Baker Ferguson, in memory of her husband. Donald Renwick Ferguson, M.D., of the Class of 1912, who died during the Second World War, is awarded to a young man who is looking forward to the study of medicine. The scholarship will pay a maximum of \$600.

The PETER MERTZ SCHOLARSHIP carries a stipend of approximately \$500 a year for four years and is awarded to an entering freshman outstanding in mental and physical vigor, who shows promise of spending these talents for the good of the college community and of the larger community outside.

The award was established in 1955 by Harold, LuEsther and Joyce Mertz in memory of Peter Mertz who was a member of the class of 1957.

The FRANK SOLOMON MEMORIAL SCHOLARSHIP may be granted to an incoming freshman or any man chosen by the Scholarship Committee who needs financial assistance to continue his education. The scholarship may be used with the approval of the Committee either for study at Swarthmore College or elsewhere, or for independent research.

SCHOLARSHIPS FOR WOMEN

OPEN SCHOLARSHIPS FOR WOMEN. Mr. and Mrs. Daniel S. White, of the Class of 1875, on the occasion of the Fiftieth Reunion of that class, established three open competitive scholarships for women, in the names of Howard White, Jr., Serena B. White, and Walter W. Green. These scholarships are given to candidates who, in the opinion of the Committee of Award, rank highest in scholarship, character and personality. The amount of the award varying from \$200 to \$1,500 is determined in the same way as the scholarships for men.

The ALUMNAE SCHOLARSHIP, established by the Philadelphia and New York Alumnae Clubs, is awarded on the same basis as the Open Scholarships. It is awarded for one year and has a maximum value of \$500.

The ANNIE SHOEMAKER SCHOLARSHIP is granted annually to a young woman of the graduating class of Friends Central School, Overbrook, Philadelphia. The recipient must have been a student at Friends Central for at least two years, she must have good health, high grades, and must be the best all-around student in her class desirous of entering Swarthmore College. This scholarship, awarded by the faculty of Friends Central School, and subject to the approval of Swarthmore College, has a maximum value of \$500.

The GEORGE K. and SALLIE K. JOHNSON FUND provides \$450 a year, to be used, at the discretion of the President of the College, in granting financial aid to young women during their senior year, it being the donor's desire that the President must be satisfied that the applicant is fitted to become a desirable teacher.

The MARY COATES PRESTON SCHOLARSHIP FUND. A sum of money has been left by will of Elizabeth Coates, the annual interest of which will be about \$450. This amount is given as a scholarship to a young woman student in Swarthmore College, preferably to a relative of the donor.

The HARRIET W. PAISTE FUND is limited by the following words from the donor's will: "the interest to be applied annually to the education of female members of our Society of Friends (holding their Yearly Meeting at Fifteenth and Race Streets, Philadelphia) whose limited means would exclude them from enjoying the advantages of an education at the college." The value of this scholarship is approximately \$350 annually.

The MARY T. LONGSTRETH SCHOLARSHIP was founded by Rebecca C. Longstreth in memory of her mother and is to be awarded annually "at the discretion of the President of the College to assist a young woman student to pursue her studies in the College." The value of this scholarship is approximately \$225 annually.

The JESSIE STEVENSON KOVALENKO SCHOLARSHIP FUND, the gift of Michel Kovalenko in memory of his wife, provides an annual income of \$225. This sum is to be awarded to a student, preferably a woman, who is in her junior or senior year and who is a major in astronomy, or to a graduate of the college, preferably a woman, for graduate work in astronomy at Swarthmore or elsewhere.

The income of the KAPPA ALPHA THETA SCHOLARSHIP FUND, given by members and friends of the Kappa Alpha Theta Fraternity at Swarthmore, is awarded annually to a woman student. The award amounts to approximately \$125 annually. One or more members of the fraternity who are on the Board of Managers serve on the Committee of Award.

The MARY WOOD FUND provides approximately \$65 a year and may be awarded to a young woman who is preparing to become a teacher.

SCHOLARSHIPS OPEN TO MEN AND WOMEN

The MARSHALL P. SULLIVAN SCHOLARSHIP FUND, established by Creth and Sullivan, Inc. in memory of Marshall P. Sullivan of the Class of 1897, provides \$1,000 annually for one or more scholarships. Preference will be given to graduates of George School, but if no suitable candidate applies from this school, graduates of other Friends schools or other persons will be eligible.

The RCA SCHOLARSHIP, provided by the Radio Corporation of America is awarded to a young man or woman who is making a creditable academic record in the field of science or engineering at the under-graduate level. This scholarship provides \$800 a year and the appointment is usually made for the junior or senior year.

The E. HIBBERD LAWRENCE SCHOLARSHIP provides approximately \$700 a year for a scholarship to an incoming freshman man or woman who ranks high in scholarship, character, and personality and who has need for financial assistance.

The EDWARD CLARKSON WILSON SCHOLARSHIP. A scholarship with an annual value of \$625 has been established at Swarthmore by friends of Edward Clarkson Wilson, '91, formerly Principal of the Baltimore Friends School. It will be awarded each year to a former student of the Baltimore Friends School, who has been approved by the faculty of the school, on the basis of high character and high standing in scholarship. In any year when there is no outstanding candidate from the students of the Baltimore Friends School, the scholarship may be awarded to another young man or woman

who shall meet the required standards and who is approved by the school faculty and the college.

The AMERICAN CYANAMID COMPANY SCHOLARSHIP of \$600 per year is awarded to an outstanding junior or senior who is majoring in chemistry.

The CLASS OF 1915 SCHOLARSHIP FUND was established on the occasion of the Twenty-fifth Reunion of the Class and provides an income of approximately \$550. This sum is to be awarded either to freshmen or other students, with preference given to descendants of the members of the Class of 1915. The Business Manager, the Deans, and members of the Class of 1915 designated by Thomas B. McCabe shall constitute the Committee of Award. This Fund will become a part of the General Endowment of the College on Alumni Day, 1970.

The CLASS OF 1930 SCHOLARSHIP is awarded annually to a young man or woman who is in need of financial assistance. Preference is given to incoming freshmen but other students are eligible. The scholarship provides \$500 annually.

The CLASS OF 1931 SCHOLARSHIP FUND was established on the 25th reunion of the class. It provides a scholarship up to a maximum of \$1,000 to a man or woman who has need for financial assistance and who ranks high in scholarship, character and personality. The award is to be made by the Admissions Committee of the College. Preference is given to entering freshmen who are children of members of the class of 1931.

The DANIEL UNDERHILL SCHOLARSHIP, given by Daniel Underhill '94, in memory of his grandfather, Daniel Underhill, member of the first Board of Managers, provides \$500 annually for a deserving student in need of financial aid.

The AMERICAN VISCOSE CORPORATION SCHOLARSHIP of \$500 per year is awarded to an outstanding sophomore or junior who is majoring in engineering, chemistry, or physics.

The WESTINGHOUSE ACHIEVEMENT SCHOLARSHIP of \$500 per year is awarded to a high ranking major in electrical or mechanical engineering for the senior year.

The RACHEL W. HILLBORN SCHOLARSHIP was founded by Anne Hillborn Philips of the Class of 1892 in memory of her mother, with the stipulation that the income shall go to a student in the junior or senior class who is studying for service in the international field. Preference will be given to a Friend or to one who intends to contribute to world understanding through diplomatic service, participation in some international government agency, the American Friends Service Committee, or similar activities. The annual income amounts to approximately \$450.

The JONATHAN K. TAYLOR SCHOLARSHIP, in accordance with the donor's will, is awarded by the Board of Trustees of the Baltimore Monthly Meeting of Friends. This scholarship is first open to descendants of the late Jonathan K. Taylor. Then, while preference is to be given to members of the Baltimore Yearly Meeting of Friends, it is not to be confined to them when suitable persons in membership cannot be found. The value of this scholarship is approximately \$450 annually.

The PHEBE ANNA THORNE FUND provides an income of approximately \$2,250 for scholarships for students needing pecuniary assistance whose previous work has demonstrated their earnestness and their ability. This gift includes a clause of preference to those students who are members of the New York Monthly Meeting of Friends. These scholarships are awarded by the college under the regulations fixed by the board.

The WESTBURY QUARTERLY MEETING, N. Y., SCHOLARSHIP, amounting to \$250, is awarded annually by a committee of that Quarterly Meeting.

The SARAH ANTRIM COLE SCHOLARSHIP was founded by her parents in memory of Sarah Antrim Cole of the Class of 1934. It is awarded to a graduate of the Worthington High School, Worthington, Ohio or of the North High School, Columbus, Ohio. The scholarship provides a maximum grant of \$500 a year.

The LAFORE SCHOLARSHIP is awarded in memory of John A. Lafore of the Class of 1895. The college in granting this scholarship will give preference to qualified candidates who show need of financial assistance and who are descendants of Amand and Margaret White Lafore. The value of the scholarship is approximately \$500 a year.

The JAMES E. MILLER SCHOLARSHIP. Under the will of Arabella M. Miller, who died Sixth Month 24th, 1922, the sum of \$5,986 was awarded to the Cambridge Trust Company, Trustee under the will of James E. Miller, to be applied to scholarships in Swarthmore College. An annual income of approximately \$200 is available and may be applied toward the payment of board and tuition of students of Delaware County (preference to be given to residents of Nether Providence Township) to be selected by Swarthmore College and approved by the Trustee.

The CHI OMEGA SCHOLARSHIP was established by members and friends of the Chi Omega Fraternity. The income provides an award of approximately \$225 annually to a member of the freshman class who is in definite need of financial aid. Preference is given to daughters or sons of members of the fraternity, but if in any year such a candidate does not apply, the committee will select a freshman woman to receive the award. Applications should be sent to the Office of the Deans before January 1st of the year in which the award is to be made. A member designated by the Fraternity serves on the Committee of Award.

The DELTA GAMMA SCHOLARSHIP. The Delta Gamma Fraternity provides a fund of which the annual income is approximately \$135.00. This sum is to be awarded to a blind student at Swarthmore College in need of financial assistance. In any year in which there is no such candidate the fund may be awarded to a freshman woman.

The KAPPA KAPPA GAMMA SCHOLARSHIP was established by the Swarthmore Alumnae chapter of the Kappa Kappa Gamma Fraternity. The income provides an award of approximately \$300 annually to a member of the freshman class who is in need of financial aid. Preference is given to children of members of the Fraternity, but if in any year such a candidate does not apply the Scholarship Committee will select a freshman to receive the award.

The income from each of the following funds is awarded at the discretion of the college to students needing pecuniary aid:

The BARCLAY G. ATKINSON SCHOLARSHIP FUND.

The REBECCA M. ATKINSON SCHOLARSHIP FUND.

The WILLIAM DORSEY SCHOLARSHIP FUND.

The GEORGE ELLSLER SCHOLARSHIP FUND.

The JOSEPH E. GILLINGHAM FUND.

The THOMAS L. LEEDOM SCHOLARSHIP FUND.

The SARAH E. LIPPINCOTT SCHOLARSHIP FUND.

The MARK E. REEVES SCHOLARSHIP FUND.

The MARY SPROUL SCHOLARSHIP FUND.

The HELEN SQUIER SCHOLARSHIP FUND.

The JOSEPH T. SULLIVAN SCHOLARSHIP FUND.

The DEBORAH F. WHARTON SCHOLARSHIP FUND.

The THOMAS WOODNUTT SCHOLARSHIP FUND.

The SAMUEL WILLETS FUND yields an income of approximately \$4,300 annually, "to be applied to educate in part or in whole such poor and deserving children as the Committee on Trusts, Endowments and Scholarships of said college may from time to time judge and determine to be entitled thereto."

In addition to the above fund, Samuel Willets gave scholarships in the name of his children, FREDERICK WILLETS, EDWARD WILLETS, WALTER WILLETS, and CAROLINE W. FRAME. These scholarships have the value of \$225 each. They are awarded by the respective parties, their heirs or assigns, or in the event that the heirs do not exercise their right, by the college authorities.

The I. V. WILLIAMSON SCHOLARSHIPS. Eleven scholarships of the value of \$150 each are offered to graduates of designated Friends schools: two each to graduates of Friends Central and George School, one in the boys' and one in the girls' department: and one each to New York Friends

Seminary, Baltimore Friends School, Wilmington Friends School, Moorestown Friends School, Friends Academy at Locust Valley, Sidwell Friends School and Brooklyn Friends School. Any income not utilized in accordance with these conditions is used for free scholarships in accordance with the will of the donor.

FRIENDS COLLEGE SCHOLARSHIP. Swarthmore College, with a group of other Friends Colleges, has established scholarships to enable students from the smaller Friends Colleges to spend a year at one of the three cooperating colleges in the Philadelphia area: Bryn Mawr, Haverford and Swarthmore. These scholarships will be granted in varying amounts according to need and ability.

SPECIAL LOAN FUNDS

Several loan funds are administered by a committee to which application should be made through the office of the financial vice-president. Loans are normally restricted to juniors and seniors. Amounts vary according to need, though the college follows the principle that one thousand dollars is the maximum indebtedness that a student should incur. Loans are normally repayable not later than five years after graduation, and carry interest at the rate of four per cent after leaving college.

The **CLASS OF 1913 LOAN FUND.**

The **CLASS OF 1916 LOAN FUND.**

The **JOHN A. MILLER LOAN FUND.**

The **PAUL M. PEARSON LOAN FUND.**

The **SWARTHMORE COLLEGE STUDENT LOAN FUND.**

The **ELLIS D. WILLIAMS FUND.**

Educational Resources

The primary educational resources of any college are the quality of its faculty and the spirit of the institution. Second to these are the physical facilities, in particular the libraries, laboratories and equipment.

Laboratories, well equipped for undergraduate instruction and in some cases for research, exist in physics, chemistry, zoology, botany, psychology, astronomy, and in civil, mechanical and electrical engineering. The Sproul Observatory, with its 24-inch visual refracting telescope, is the center of much fundamental research in multiple star systems. The Edward Martin Biological Laboratory provides exceptional facilities for work in psychology, zoology, botany, and pre-medical studies. Recent additions to Beardsley Hall increase the facilities for laboratory instruction and research in engineering.

The SWARTHMORE COLLEGE LIBRARY, in part the gift of Andrew Carnegie, contains reading rooms, offices and a collection of 187,000 volumes. Some 5500 volumes are added annually. About 783 periodicals are received regularly. The general collection, including all but the scientific and technical books and journals, is housed in the library building, situated on the front campus. An addition providing storeroom for 150,000 volumes was erected in 1935. The library is definitely a collection of books and journals for undergraduate use. The demands of Honors work, however, make necessary the provision of large quantities of source material not usually found in collections maintained for undergraduates. It is a point of library policy to try to supply, either by purchase or through inter-library loan, the books needed by students or members of the faculty for their individual research.

In addition, the library contains certain special collections—the British Americana collection, the Wells Wordsworth and Thomson collections, and a collection of the issuances of 486 private presses.

A number of special features enrich the academic background of the college. Among these are the following:

The BIDDLE MEMORIAL LIBRARY is an attractive fire-proof structure of stone and steel given by Clement M. Biddle, '96, in memory of his father, Clement M. Biddle, who served for over twenty years as a member of the Board of Managers or as an officer of the Corporation of the College. This Library contains two important Collections: the Friends Historical Library and the Swarthmore College Peace Collection.

The FRIENDS HISTORICAL LIBRARY, founded in 1870 by Anson Lapham, is one of the outstanding collections in the United States of manuscripts,

books, pamphlets, and pictures relating to the history of the Society of Friends. The library is a depository for records of Friends Meetings belonging to Philadelphia Yearly Meeting. More than 1,000 record books have been deposited; many of them have been reproduced on microfilm, for which a reading machine is available. The William Wade Hinshaw Index to Quaker Meeting Records indexes the material of genealogical interest in the records of 307 meetings in various parts of the United States. Notable among the other holdings are the Charles F. Jenkins Whittier Collection (first editions and manuscripts of John Greenleaf Whittier), the Mott Manuscripts (over 400 autograph letters of Lucretia Mott, antislavery and women's rights leader), and the Hicks Manuscripts (more than 300 letters of Elias Hicks, a famous Quaker minister). The Library's collection of books and pamphlets by and about Friends numbers approximately 20,000 volumes. About 125 Quaker periodicals are currently received. There is also an extensive collection of photographs of meeting houses and pictures of representative Friends. It is hoped that Friends and others will consider the advantages of giving to this Library any books and family papers which may throw light on the history of the Society of Friends.

The SWARTHMORE COLLEGE PEACE COLLECTION, a section of the Friends Historical Library, is of special interest to research students and others seeking the records of the Peace Movement. Beginning with Jane Addams' personal papers and books relating to peace, the collection contains a rich variety of the documents of early peace groups as far back as the first peace committees in England and the United States about 1815, as well as rare peace posters from many lands, and correspondence and writings of peace and arbitration leaders. Individual writings on peace date back to about 1642. The collection includes some 750 titles of magazines and bulletins devoted to peace, published in the United States and abroad during the past 140 years. There are about 160 titles of bulletins and magazines currently received in eleven languages from 25 countries. This collection is the official depository for the leading peace organizations in the United States. A more complete description of the collection will be found in the *Guide to the Swarthmore College Peace Collection, A memorial to Jane Addams*, published by the College and available for loan on request.

The WILLIAM J. COOPER FOUNDATION provides a varied program of lectures and concerts which enriches the academic work of the college. The Foundation was established by William J. Cooper, a devoted friend of the college, whose wife, Emma McIlvain Cooper, served as a member of the Board of Managers from 1882 to 1923. Mr. Cooper bequeathed to the college the sum of \$100,000 and provided that the income should be used "in bringing to the college from time to time eminent citizens of this and other countries who are leaders in statesmanship, education, the arts, sciences, learned professions and business, in order that the faculty, students and the

college community may be broadened by a closer acquaintance with matters of world interest." Admission to all programs is without charge.

The Cooper Foundation Committee works with the departments and with student organizations in arranging single lectures and concerts, and also in bringing to the college speakers of note who remain in residence for a long enough period to enter into the life of the community. Some of these speakers have been invited with the understanding that their lectures should be published under the auspices of the Foundation. This arrangement has so far produced nine volumes:

Lindsay, Alexander Dunlop. *The Essentials of Democracy*. Philadelphia, University of Pennsylvania Press, 1929.

Lowes, John Livingston. *Geoffrey Chaucer and the Development of His Genius*. New York, Houghton Mifflin Co., 1934.

Weyl, Hermann. *Mind and Nature*. Philadelphia, University of Pennsylvania Press, 1934.

America's Recovery Program, by A. A. Berle, Jr., John Dickinson, A. Heath Onthank . . . and others . . . London, New York, etc., Oxford University Press, 1934.

Madariaga, Salvador de. *Theory and Practice in International Relations*. Philadelphia, University of Pennsylvania Press, 1937.

Streit, Clarence Kirshman. *Union Now; a Proposal for a Federal Union of the Democracies of the North Atlantic*. New York, Harper, 1939.

Krogh, August. *The Comparative Physiology of Respiratory Mechanisms*. Philadelphia, University of Pennsylvania Press, 1941.

Wilcox, Clair, Editor. *Civil Liberties under Attack*. A series of lectures given in 1950-51. Philadelphia, University of Pennsylvania Press, 1951.

Redfield, Robert. *Peasant Society and Culture; An Anthropological Approach to Civilization*. Chicago, The University of Chicago Press, 1956.

The ARTHUR HOYT SCOTT HORTICULTURAL FOUNDATION. About three hundred acres are contained in the College property, including a large tract of woodland and the valley of Crum Creek. Much of this tract has been developed as an horticultural and botanical collection of trees, shrubs and herbaceous plants through the provisions of the Arthur Hoyt Scott Horticultural Foundation, established in 1929 by Mrs. Arthur Hoyt Scott and Owen and Margaret Moon as a memorial to Arthur Hoyt Scott of the Class of 1895. The plant collections are designed both to afford examples of the better kinds of trees, shrubs and herbaceous plants which are hardy in the climate of Eastern Pennsylvania and suitable for planting by the average gardener, and to beautify the campus. There are exceptionally fine displays of Japanese cherries, flowering crab apples and tree peonies, and a great variety of lilacs, rhododendrons, azaleas, daffodils, irises, herbaceous

peonies, hemerocallis and chrysanthemums. Many donors have contributed generously to the collections. (For full information see *Bulletin of Swarthmore College*, Vol. xxxvii, No. 5.)

The BRONSON M. CUTTING MEMORIAL COLLECTION OF RECORDED MUSIC was established at Swarthmore College in 1936 by a gift of approximately four thousand phonograph records, a radio-phonograph, books and musical scores, from the family of Bronson Murray Cutting, late Senator from New Mexico. Its object is to make the best recorded music available to the undergraduates, faculty, and friends of Swarthmore College, in cooperation with the work of the college Department of Music. The collection is kept up to date with current additions.

The BENJAMIN WEST LECTURE, made possible by gifts from members of the class of 1905 and other friends of the College, is given annually on some phase of art. It is the outgrowth of the Benjamin West Society which built up a collection of paintings, drawings, and prints, which are exhibited, as space permits, in the college buildings. The lecture owes its name to the American artist, who was born in a house which still stands on the campus and who became president of the Royal Academy.

The POTTER SPEECH COLLECTION, established in 1950 with accumulated income of the William Potter Public Speaking Fund, includes a wide variety of recorded poetry, oratory, and drama. It is designed to make available to the Swarthmore College community and friends the best examples obtainable in recordings of literature intended for the ear as well as the eye. Among the three hundred items are included full-length versions of Shakespearean plays, contemporary poets reading their own work, and traditional poetry read by professional speakers. The Department of English Literature administers the collection and selects current additions.

College Life

HOUSING

Swarthmore is primarily a residential college, conducted on the assumption that an important element in education comes from close association of students and instructors. Most students live in dormitories. Many members of the faculty live on or near the campus.

Residence Halls

There are four dormitories for men: Wharton Hall, named in honor of its donor, Joseph Wharton, at one time President of the Board of Managers, and three buildings on the former Mary Lyon School property.

The women's dormitories include the upper floors in the wings of Parrish Hall; Worth Hall, the gift of William P. Worth, 1876, and J. Sharpless Worth, ex-1873, as a memorial to their parents; Robinson House; Palmer, Pittenger and Roberts Hall on South Chester Road; and Woolman House.

All freshmen are assigned to rooms by the Deans. Other students choose their rooms in an order determined by lot. Special permission must be obtained to room outside the dormitories.

Students may occupy college rooms during vacations only by special arrangements with the Deans and payment of the required fee. Freshmen are asked to leave college immediately after their last examinations in the spring so that their rooms may be used by Commencement visitors.

Dining Rooms

All students, both men and women, have their meals in two adjoining College Dining Rooms in Parrish Hall. The dining rooms are closed during all vacations.

RELIGIOUS LIFE

The religious life of the college is founded on the Quaker principle that the seat of spiritual authority lies in the Inner Light of each individual. The Society of Friends is committed to the belief that religion is best expressed in the quality of everyday living. There are accordingly no compulsory religious exercises, save in so far as the brief devotional element in Collection may be so considered. Students are encouraged to attend the churches of their choice. Episcopal, Presbyterian, Methodist, and Christian Science churches are located in the borough of Swarthmore; Catholic and other churches in the nearby towns of Morton, Media, and Chester. The Swarthmore Meeting House is located on the campus. Students are cordially invited to attend its meeting for worship on Sunday. Extra-curricular

groups with faculty cooperation exist for the study of the Bible and the exploration of common concerns in religion.

An assembly of the college, called Collection, is held at 10:00 a. m. every Thursday in Clothier Memorial; attendance of students is required. There is regularly a period of silence according to the Friendly tradition and, when these are in keeping with the remainder of the program, the singing of hymns and a reading from the Bible. Lasting from one-half to three-quarters of an hour, Collection normally includes an address; but this is varied by the occasional introduction of musical, dramatic, and other programs.

STUDENT WELFARE

Health

The college physician holds daily office hours at the college, where students may consult him without charge. A student must report any illness to the college physician, but is free to go for treatment to another doctor if he prefers to do so.

At the time of admission each student must present a brief medical history and health certificate, prepared by the family physician on a form supplied by the college. Pertinent information about such matters as physical reserve, unusual medical episodes, severe allergies, or psychiatric disturbances will be especially valuable to the college Health Service. All new students must have been successfully vaccinated against smallpox within five years, in accordance with Pennsylvania State law.

The college physician gives physical examinations to all students at the beginning of each year. There is close cooperation with the Departments of Physical Education. Recommendations for limited activity are made for those students with physical handicaps. In some cases a student may be excused entirely from the requirements of the Physical Education Departments.

The college health program includes an annual chest x-ray which is compulsory for all students. Should the student fail to meet his x-ray appointment, he is required to have one taken at his own expense.

There are two infirmaries, one for men and one for women. The infirmary for men is in Section F of Wharton Hall; the women's infirmary is at the east end of Parrish Hall. A registered nurse is in charge of each, under the direction of the college physician.

Each student is allowed ten days care in the infirmaries per term without charge unless the services of a special nurse are required. After ten days, a charge of \$3.00 per day is made. Students suffering from a communicable disease or from illness which makes it necessary for them to remain in bed, must stay in the infirmary for the period of their illness. A charge is made for special expensive medicines and certain immunization procedures, but ordinary medicines are furnished without cost.

The medical and infirmary facilities of the college are available to students injured in athletic activities or otherwise, but the college cannot assume additional financial responsibility for medical and surgical expenses arising from accidents. Accident insurance coverage is, therefore, required for all students participating in athletics and is recommended for all others. (For details see p. 32.)

The college psychiatric consultants hold office hours by appointment each week. A student may have from one to three interviews. The purpose of this service is to be of help in all types of emotional problems.

Vocational Advising

The college provides vocational information and advice to assist students in their choice of a career. Conferences and field trips are planned periodically and interviews are arranged with prospective employers. Help is offered to students in finding employment. In addition, summer work is planned to give students job experience in various fields.

Alumni Office

The Alumni Office keeps records of the addresses of all living graduates and alumni of the college. It helps edit the Swarthmore alumni magazine, and acts as liaison for the college with all alumni and alumni groups, interpreting to them the present plans and policies of the college.

News Office

The News Office does a two-fold job. It helps prepare the several publications put out by the college known as Swarthmore College Bulletins. These include the alumni magazine, the President's Report, the Catalogue, the Student Handbook, the Viewbook, and other miscellaneous issues. In addition to this, the News Office, through the largely student operated News Bureau, works with the press and other communications media in publicizing news that is of interest to the general public.

Student Advising

The Deans and their assistants hold the primary responsibility for advising all students. However, there are many other advisers available to each student.

Each freshman is assigned to a faculty member who acts as his course adviser until this responsibility falls to the chairman of the student's major department at the end of his sophomore year. Faculty members have also been appointed as advisers for each of the men's varsity athletic teams. They work closely with the team, attending practice as well as all home and away games.

A group of upperclass women, under the direction of the Women's Student Government Association, serve as counselors for all freshman women, several counselors being assigned to each freshman hall. There are also student proctors in each of the men's dormitory sections. A group of students cooperate with proctors and counselors in helping the Deans with the placement program conducted during the freshman week.

Special problems may be referred by the Deans to the college physician or to the consulting psychiatrists.

THE STUDENT COMMUNITY

Student Conduct

In general the association of men and women in academic work and social life is to be governed by good taste and accepted practice rather than by elaborate rules. The Society of Friends has historically been conservative in social matters, and its influence within the college community is one of the important factors in making Swarthmore what it is. Certain rules, however, are of sufficient importance to deserve attention here:

1. The possession and use of liquor on the campus is forbidden, as is drunken conduct.

2. No undergraduate may maintain an automobile while enrolled at the College without special permission. The administration of this rule is in the hands of a student-Faculty committee, which authorizes cars for the use of student organizations, and in some cases for special needs such as jobs dependent upon cars. Day students may use cars for commuting to College, but special arrangements for stickers must be made for campus parking. More detailed information may be had from the Office of the Deans.

3. It is college policy to discourage premature marriages by ruling that if two undergraduates marry, only one may remain in college. Some exceptions have been provided in the case of veterans and upperclass students and information about them may be obtained from the Office of the Deans.

College rules which affect the entire college community are discussed and formulated by the Student Affairs Committee, which is composed of members of the college administration, faculty, and student body. This committee delegates to student government agencies as much authority in the administration of rules as they responsibly accept.

Student Council

The semi-annually elected Student Council represents the entire undergraduate community and is the chief body of student government. Its efforts are directed toward the coordination of student activities and the expression of student opinion in matters of college policy.

Committees of the Council include the Budget Committee, which regulates distribution of funds to student groups; the Community Service Committee, which administers welfare projects; the Elections Committee, which supervises procedure in campus elections; and the Social Committee, see below. The Curriculum Committee cooperates with a similar committee of the faculty in the discussion of matters relating to the academic program of the college. In addition to these, there are several joint Faculty-Student Committees, whose student membership is appointed by the Council: Collection, Cooper Foundation, Motion Pictures, Men's Athletics and Student Affairs.

Men's Student Government

The men students of the college are represented by the Men's Executive Committee, a group elected to take responsibility for specified problems which have to do primarily with dormitory life. The Men's Judiciary Committee, selected by the Men's Executive Committee, has jurisdiction over cases where male undergraduates have violated college rules in the dormitories or on the campus, with the exception of the fraternity lodges. The fraternities have established a Fraternity Judiciary Committee to enforce college rules as they pertain to fraternities and fraternity lodges.

Women's Student Government

All women students are members of the Women's Student Government Association, headed by an Executive Board elected to promote a great variety of women's interests. This board includes the officers of the Association, the hall presidents and the chairmen of certain important committees: Judiciary, which maintains social regulations; Vocational, which assists the women's Vocational Director; Somerville, which arranges the program for Somerville Day, on which alumnae are invited to return to the College, and fosters student-alumnae relations.

Social Committee

An extensive program of social activities is managed by the Social Committee appointed by the Student Council. The program is designed to appeal to a wide variety of interests, and is open to all students. At no time is there any charge for college social functions.

Extra-Curricular Activities

In addition to the foregoing organizations, Swarthmore students have an opportunity to participate in a program of extra-curricular activities wide enough to meet every kind of interest. No credit is given for work in such varied fields as sculpture, play-writing, publishing the college newspaper or playing the cello in the orchestra. However, the college encourages a student to participate in whatever activity best fits his personal talents and inclinations, believing that satisfactory avocations are a necessary part of life for the well-rounded individual.

Extra-curricular musical activities at Swarthmore are numerous and well-supported. The college chorus is led by Professor Swing, and the college orchestra by Professor Reese. There are chamber music groups, madrigal groups, and public performances of the musical works of students in composition. There is an excellent college record collection, there are facilities for private practice, and there are student tickets for the Philadelphia Orchestra. The Cooper Foundation presents a distinguished group of concerts each year.

There are faculty advisers or special instructors for the Little Theatre Club, Print Club, the Camera Club, the Sculpture Group, the drawing and painting groups, the creative writers, and the modern dancers. Many other student groups for the discussion of public affairs, the integration of the sciences, the presentation of student radio programs, and the editing of college publications, conduct their own affairs with occasional advice from the faculty.

A handbook describing more fully all these activities and many others, written by the students themselves, can be had upon request from the Office of the Deans.

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. The second part outlines the procedures for handling discrepancies and errors, including the steps to be taken when a mistake is identified. The third part provides a detailed explanation of the accounting cycle, from identifying transactions to preparing financial statements. The final part discusses the role of the accountant in providing financial information to management and other stakeholders.

The document also covers the various methods used to record transactions, such as the double-entry system. It explains how debits and credits are used to ensure that the accounting equation remains balanced. Additionally, it discusses the importance of proper classification of transactions into different accounts, such as assets, liabilities, and equity. The document concludes by highlighting the significance of accurate financial reporting in decision-making and the overall success of the organization.

In conclusion, this document provides a comprehensive overview of the accounting process, from the initial recording of transactions to the final preparation of financial statements. It serves as a valuable resource for anyone involved in the financial management of an organization.

STUDENTS (1915-16)

**THE
EDUCATIONAL PROGRAM
OF
SWARTHMORE COLLEGE**

General Statement

Swarthmore College offers the degree of Bachelor of Arts and the degree of Bachelor of Science. The latter is given only in the Division of Engineering; the former, in the Divisions of the Humanities, the Social Sciences, and Mathematics and the Natural Sciences.* Eight semesters of resident study, which are normally completed in four years, lead to a Bachelor's degree.

The selection of a program will depend upon the student's interests and vocational plans. Programs in engineering, pre-medical courses, and chemistry, for example, are the usual preparation for professional work in these fields. Students planning a career in law, business, or government service find majors in the humanities or social sciences of great value.

The purpose of a liberal education, however, is not primarily to provide vocational instruction, even though it provides the best foundation for one's future vocation. Its purpose is to help students fulfill their responsibilities as citizens and grow into cultivated and well rounded individuals. A liberal education is concerned with our cultural inheritance, the world of thought, and the development of aesthetic, moral, and spiritual values.

It is necessary for most students to concern themselves with the problem of making a living. But this concern should not lead them to a specialization that is too early and too narrow. They still have need of broadening the scope of their experience. Particular skills may afford readier access to routine employment, but positions of greater responsibility will be occupied by those who are equipped to think their way through new problems and to conceive of their functions in a larger context of time and place. Liberal education and vocational training may be the joint products of a common process, and the courses here offered should be selected with this large purpose.

For this reason, all students, during the first half of their college program, are expected to complete the general college requirements, to choose their major and minor subjects, and to prepare for advanced work in these subjects by taking certain prerequisites. Five full courses or their equivalent in half courses constitute the normal program for each of the first two years. Each course represents from eight to twelve hours of work a week including class meetings, laboratory periods and individual preparation.

The program for upper class students affords a choice between two methods of study: Honors Work, leading to a degree *with Honors*, and General Courses. An Honors student concentrates on three related subjects which he studies by the seminar method. At the end of his senior year he must take a

* For groupings of departments, see page 18.

battery of eight examinations on the work of his seminars, set by outside examiners. (The system will be explained more fully below.)

A student in general courses has a somewhat wider freedom of election and takes four full courses or their equivalent in each of the last two years. At the end of his senior year he is required to pass a comprehensive examination given by his major department.

The program for engineering students follows a similar basic plan, with certain variations which are explained on page 88. Courses outside the technical fields are spread over all four years.

In addition to scholastic requirements for graduation, all students must meet certain standards of participation in Physical Education as set forth in the statement of those departments (see pp. 133-134) and must attend the Collection exercises of the college (see p. 47).

The course advisers of freshmen and sophomores are members of the faculty appointed by the Deans. For juniors and seniors the advisers are the chairmen of their major departments or their representatives.

Program for Freshmen and Sophomores

The curriculum for the first two years is designed primarily to contribute to a student's general education by giving him an introduction to the methods of thinking and the content of knowledge in a variety of fields important to a liberal education.

1. The traditional humanistic studies—those studies through which man learns to understand himself and his relationship to his fellows as individuals, and the enduring values in human experience.

2. The social sciences—those studies through which man learns to understand the nature of organized society, past and present, and his relationship to it.

3. The natural sciences—those studies through which man learns to understand his physical environment, both organic and inorganic, outside of his own individual and social being.

Each student shall meet the following general requirements, ordinarily during the first two years:

1. A year-course to be chosen from Astronomy 1-2, Biology 1-2, Chemistry 1-2, Physics 1-2, Mathematics 1-2, and Mathematics 3-4.
2. Two year-courses to be chosen from Economics 1-2, History 1-2, and Political Science 1-2. For students in the Divisions of Engineering and of Mathematics and the Natural Sciences the requirement shall consist of one year-course.

3. For students in the Humanities and Social Science divisions, four half-courses in four different departments, to be chosen as follows:

One half-course in literature (English or foreign),
One half-course in Fine Arts, Music, or Religion,
Two half-courses in History, Philosophy, or Psychology.

For students in the Engineering and Natural Science divisions, four half-courses in at least two departments:

Two half-courses to be chosen from literature (English or foreign),
Fine Arts, Music, or Religion.

Two half-courses to be chosen from History, Philosophy, or Psychology.

History can be used as an option here only by students in any division who have not chosen History 1-2 to satisfy requirement 2 above.

Pre-medical students with a major in the Humanities or the Social Sciences may substitute a second half-course in literature for the second requirement above in order to satisfy medical school requirements.

4. All students except those majoring in engineering must include in their program sufficient work in a modern or classical language to complete course 4 or its equivalent. This may be met in whole or in part by secondary school preparation as measured by the appropriate achievement test of the College Entrance Examination Board.

Students entering college with special preparation in any one of these subjects may apply for exemption. No student may take more than four half courses in any one department during the first two years except in special circumstances. Applications for exceptions must be made to the Committee on Academic Requirements.

In addition to the requirements listed above, prerequisites must be completed for the work of the last two years in major and minor subjects, and sufficient additional electives must be taken to make up ten full courses.

It is expected that, after completion of the minimum courses in the general program of the first two years, the student will devote the remainder of his sophomore year to preparing himself for more advanced study of those subjects which have most interested him and to other courses which will increase the range of his knowledge. He should decide, as early in his sophomore year as possible, upon two or three subjects in which he might like to major and should consult the statements of the departments concerned as to required and recommended courses and supporting subjects. In most cases he is advised to take not more than one semester of work in any subject beyond the first course.

The requirement in foreign language (either classical or modern) is such that an exceptionally well prepared freshman may demonstrate his completion of it before entering college by his rating in an Achievement

Test given by the College Entrance Examination Board. The results of the tests indicate, however, that most students need to devote from one to four terms to further language study. The desired standard is normally met on the basis of four years' work in high school, or of three or two years' work in high school followed by one or two terms in college. If a student fulfills the requirement with a language which he begins in college, he will need to study it for four terms. If he fulfills it with a language begun elsewhere, his progress toward the degree of competence demanded is measured by a placement test. This may be one of the achievement tests of the College Entrance Examination Board which he has taken as a requirement for admission. Additional placement tests are given when necessary by the Swarthmore departments of language.

Physical education is required of all students (except veterans) in the first two years. The requirements are stated in full on p. 63 and in the statements of the departments of Physical Education.

Program for Juniors and Seniors

WORK IN COURSE

The work of juniors and seniors in Course includes some intensive, specialized study within a general area of interest. This comprises enough work in a single department (designated as a "major") to make an equivalent of four full courses. Work taken during the first two years may be counted toward fulfillment of the major requirements but not more than six full courses or twelve half courses may be taken in the major field. Before graduation the student must pass a comprehensive examination in his major subject.

A student must choose his major subject at the end of the sophomore year, and apply formally through the Registrar to be accepted by the division concerned. The decision will be based on an estimate of his ability in his major subject as well as on his record. If a student does not secure divisional approval, he cannot be admitted to the junior class.

A student's course adviser during his junior and senior years is the chairman of his major department (or a member of the department designated by the chairman) whose approval he must secure for his choice of courses each semester.

In addition to major and recommended supporting subjects, juniors and seniors usually have room for at least one elective a year.

The completion of eighteen full courses, or equivalent, with a minimum average of C, normally constitutes the course requirement for a degree. Under certain circumstances this may be reduced to seventeen. A student may carry extra work after the freshman year with the approval of his course adviser and of the Committee on Academic Requirements, provided that his record in the previous year has been satisfactory.

The faculty may award the bachelor's degree with Distinction to students who have done distinguished work in the course program.

READING FOR HONORS

The Honors Program, initiated in 1922 by President Frank Aydelotte, is a distinctive part of Swarthmore's educational life. It seeks to free from the limitations of classroom routine those students whose maturity, interest, and capacity suit them for independent work. While the program is designedly flexible and responsive to new needs, it has been characterized from the beginning by three basic elements, which taken together may be said to be the essence of the system.

(1) Honors work involves a concentration of the student's attention during his last two years upon a limited and integrated field of studies. He pursues only two subjects during a semester, thereby avoiding the fragmentation of interest that may result from a program of four or more courses with their daily assignments and frequent examinations. The content of the subject matter field is correspondingly broader, permitting a wide range of reading and investigation and demanding of the student correlations of an independent and searching nature.

(2) Honors work frees the student from periodic examinations, since his thinking is under continual scrutiny by his classmates and instructors. By this program he undertakes to subject himself at the end of two years of Honors work to examinations in all of the eight fields studied. In these he is expected to demonstrate his competence in a field of knowledge rather than simply his mastery of those facts and interpretations which his instructor has seen fit to present. These examinations, consisting of a three-hour paper in each field, are set by examiners from other institutions who read the papers and then come to the campus to conduct an oral examination of each student, in order to clarify and enlarge the basis of their judgment of his command of his material.

(3) Honors work is customarily carried on in seminars of seven students or less or in independent projects leading to a thesis. Seminars meet once a week, in many cases in the home of the instructor, for sessions lasting three hours or more. The exact technique of the seminar varies with the subject matter, but its essence is a cooperative search for truth, whether it be by papers, discussion, or laboratory experiment. Each student has an equal responsibility for the assimilation of the whole of the material and is correspondingly searching in his scrutiny of ideas presented by his fellows or by his instructor. The student is expected to devote half of his working time during a semester to each of his fields of study.

In practice three avenues toward an Honors degree are open:

(1) The standard program consists of eight subjects studied during the last four semesters leading to examinations by the visiting examiners. In the

Divisions of the Natural Sciences and of Engineering, where there is a heavy burden of prerequisite courses, the student may offer as few as six fields for examination, subject to the approval of the division. The Divisions of the Humanities and of the Social Sciences allow seven examinations instead of eight only in cases of clear hardship (as in the case of some transfer students); they do not allow such remission in order to permit the student to pursue work of elementary or intermediate level in Course or to accommodate some unrelated subject in his program.

(2) Students who have a special reason to study for one or two semesters abroad or in another American institution must take the normal number of examinations prescribed by their divisions. Such programs must be worked out in advance, since it may not be possible to provide visiting examiners for work offered elsewhere and since instruction in some fields of the student's choice may not be available in the other institution. In general the student following this avenue to an Honors degree must weigh carefully the advantage of working independently or under tutorial guidance against the loss he incurs by missing both the stimulus and the criticism provided by his fellows in seminar.

(3) Students who at the end of the sophomore year did not elect or were not permitted to read for Honors, but whose work has subsequently shown distinction may be encouraged to take the regular Honors examinations so that they may receive the degree of Honors recommended by the visiting examiners. They shall receive no remission of the number of examinations by reason of their preparation in Course but shall be subject to the regulations governing Honors programs of the division concerned. Such students must before the end of the seventh semester petition the division for permission to take the Honors examinations and must submit an acceptable list of examinations which they are prepared to take.

The normal pattern in Honors programs is four seminars (or examinations) in the major department and two in each of two minor departments. No student is allowed more than four seminars in his major; in those cases where he offers three seminars in each of two fields, one must be designated as his major. While there is a general belief that two seminars in a minor field are desirable because of the mutual reinforcement they provide, there are by custom certain seminars which are allowed to stand alone. Thus there is a considerable flexibility in Honors programs, each being subject to the scrutiny of the departments and divisions in which the work is done.

A candidate for admission to Honors should consult the chairmen of his prospective major and minor departments during the second semester of his sophomore year and work out a program for the junior and senior years. This proposed program must be filed in the office of the Registrar who will forward it to the divisions concerned. The acceptance of the candidate by the divisions depends in part upon the quality of his previous work as in-

dictated by the grades he has received but mainly upon his apparent capacity for assuming the responsibility of Honors work. The names of the accepted candidates are announced later in the spring. The major department is responsible for the original plan of work and for keeping in touch with the candidate's progress from semester to semester. The division is responsible for approval of the original program and of any later changes in that program.

At the end of the junior year Honors students are required to take the Honors examinations set at that time for the fields they have studied. These trial papers, however, are read by their instructors, not by the visiting examiners. On the basis of the showing made in these examinations, the student may be advised or even required to return to Course, or he may be warned that he continues in Honors at his own risk. Those students who return to Course under these circumstances or for other reasons will receive grades for the work they have done while reading for Honors, but in no case without taking examinations over the fields covered.

At the end of the senior year the reading of the examinations and the decision of the degree of Honors to be awarded the candidates is entirely in the hands of the visiting examiners. Upon their recommendation, successful candidates are awarded the Bachelor's Degree with Honors, with High Honors, or with Highest Honors. When the work of a candidate does not in the opinion of the examiners merit Honors of any grade, his papers are returned to his instructors, who decide, under rules of the Faculty, whether he shall be given a degree in Course.

PRE-MEDICAL PROGRAM

Problems unique to the pre-medical student are referred to the Committee on the Pre-Medical Program. Information and advice on general requirements and on the special requirements of specific medical schools may be obtained by either the student or his adviser from this committee. In addition, it is a function of the committee to prepare a statement of evaluation and its recommendation to each medical school to which the student may apply, basing this statement on all information available to it, including the student's record and faculty evaluations.

In conference with the student, the course adviser maps out a program based on requirements listed below, the college's general requirements, and the particular needs and interests of the student. Beyond these considerations the need for understanding basic social problems, the cultivation of sensitiveness to cultural values, and the value of intensive work in at least one field is kept in mind in mapping an individual program.

The following courses are among the minimum requirements of most medical schools: Biology 1-2, Chemistry 1-2, Chemistry 25 or 28-29 (some

medical schools require a year course in organic chemistry), Mathematics 1-2 or 3-4, Physics 1-2, English (two semester courses). The foreign language requirements of medical schools are automatically met when the student has satisfied the college language requirement, which includes language course 4 or its equivalent. In addition, some medical schools require quantitative analysis (Chemistry 26) or comparative anatomy (Zoology 11). Advanced work in biology, chemistry and mathematics is recommended where the student's program and interests permit. The student is urged to familiarize himself with the specific requirements of those medical schools in which he is interested in planning his program.

The work of the junior and senior year may be done either in the honors program or in course. Intensive work of the major may be carried out in any department of the student's choice, or major requirements may be met by completing three full courses in each of two related departments in the Division of Mathematics and the Natural Sciences. In the latter case the comprehensive examination will be jointly arranged by the departments concerned.

Although some students have been admitted to medical schools upon the completion of three years of college work, most medical schools strongly advise completion of four years of college, and in practice admit very few with less.

FOREIGN STUDY

Students who wish to study abroad should consult with the dean and the chairman of their major department and plan a specific program which must be approved by the departments concerned. A copy of this program should be filed in the Registrar's office. Examinations must ordinarily be taken upon return to Swarthmore if credit is desired, but these examinations may be waived if satisfactory evidence is presented that examinations were successfully passed abroad.

WASHINGTON SEMESTER PROGRAM

Swarthmore College participates in the Washington Semester program, organized under the auspices of the American University. Under this program, students may spend one of their regular college semesters, during either their Junior year or the first half of their Senior year, in Washington, D. C., taking courses at American University and doing a field project relating to some aspect of the Federal Government or its work. Students majoring in any subject are eligible.

The number of places available to Swarthmore College students is limited. Selections are made by a committee and applications should be in the hands of its chairman by April 1 for the fall semester and by November 1 for the spring semester.

Faculty Regulations

ATTENDANCE AT CLASSES AND COLLECTION

Members of the faculty will hold students responsible for regular attendance at classes and will report to the Deans the name of any student whose repeated absence is in their opinion impairing the student's work. The number of cuts allowed in a given course is not specified, a fact which places a heavy responsibility on all students to make sure that their work is not suffering as a result of absences. Since freshmen must exercise particular care in this respect and since the faculty recognizes its greater responsibility toward freshmen in the matter of class attendance, it is expected that freshmen, especially, will attend *all* their classes.

When illness necessitates absence from classes the student should report at once to the nurses or to the college physician.

The last meeting before vacation and the first meeting after vacation in each course must be attended. The minimum penalty for violation of this rule is probation.

Absences from Collection are acted upon by the Deans as instructed by the faculty. All students are allowed four absences from Collection each term.

GRADES

Instructors report to the Deans' office at intervals during the year upon the work of students in courses. Informal reports during the semester take the form of comments on unsatisfactory work. At the end of each semester formal grades are given in each course under the letter system, by which *A* means excellent work, *B* good work, *C* fair work, *D* poor work, and *E* failure. *W* signifies that the student has been permitted to withdraw from the course by the Committee on Academic Requirements. *X* designates a condition; this means that a student has done unsatisfactory work in the first half of a year course, but by creditable work during the second half may earn a passing grade for the full course and thereby remove his condition.

Inc. means that a student's work is incomplete with respect to specific assignments or examinations. The Faculty has voted that the grade given in a course should incorporate a zero for any part of the course not complete by the date of the final examination. The grade *Incomplete* should be given only after consultation with the Registrar and only in cases in which it can be shown that illness, military service, or the like made it impossible for the student to complete his work before the deadline, or in cases in

which the instructor wishes to insist on the completion of the work before giving a grade with penalties. If an *Inc.* is received, it must normally be made up in the term immediately following that in which it was incurred. A date is set at the end of the first six weeks of each term when make-up examinations must be taken and late papers submitted. Under special circumstances involving the use of laboratories or attendance at courses not immediately available, a student must secure permission to extend the time for making up an incomplete until the second term following. This permission must be given in writing and filed in the Office of the Registrar. Any not made up within a year from the time it was imposed shall be recorded as *E*, a failure which cannot be made up.

Reports are sent to parents and to students at the end of each semester.

For graduation in general courses, a *C* average is required; for graduation in honors work, the recommendation of the visiting examiners.

EXTRA OR FEWER COURSES

A regular student is expected to take the prescribed number of courses in each semester. If more or fewer courses seem desirable, he should consult his course adviser and file a petition with the Committee on Academic Requirements. A student who wishes to take fewer than the normal number of courses should register for the regular program and file a petition to drop one or more courses.

Applications involving late entrance into a course must be received within the first two weeks of the semester. Applications involving withdrawal from a course must be received not later than the middle of the semester.

EXAMINATIONS

Any student who is absent from an examination, announcement of which was made in advance, shall be given an examination at another hour only by special arrangement with the instructor in charge of the course.

No examination *in absentia* shall be permitted. This rule shall be interpreted to mean that instructors shall give examinations only at the college and under direct departmental supervision.

SUMMER SCHOOL WORK

Students desiring to transfer credit from a summer school are required to obtain the endorsement of the chairman of the department concerned before entering upon the work, and after completing the work are required to pass an examination set by the Swarthmore department.

PHYSICAL EDUCATION

Physical education is required of all women and non-veteran men in the freshman and sophomore years, unless an excuse is granted by the college

physician. A minimum of three periods per week shall be required. If any semester's work of the first two years is failed, it shall be repeated in the junior year. No student shall be permitted to enter his senior year with a deficiency in physical education.

EXCLUSION FROM COLLEGE

The college reserves the right to exclude at any time students whose conduct or academic standing it regards as undesirable, and without assigning any further reason therefor; in such cases fees will not be refunded or remitted, in whole or in part, and neither the college nor any of its officers shall be under any liability whatsoever for such exclusion.

Requirements for Graduation

BACHELOR OF ARTS AND BACHELOR OF SCIENCE

The degree of Bachelor of Arts and Bachelor of Science are conferred upon students who have met the following requirements for graduation:

1. The candidate must have completed eighteen full courses or ten courses and eight seminars with an average grade of C.
2. He must have complied with the course requirements for the first two years.
3. He must have met the requirements in the major and supporting fields during the last two years.
4. He must have passed satisfactorily the comprehensive examinations in his major field or met the standards set by visiting examiners for a degree with honors.
5. He must have completed four terms of study at Swarthmore College, two of which have been those of the senior year.
6. He must have completed the physical education requirements set forth on page 63 and in the statements of the Physical Education Departments.
7. He must have attended the Collection exercises of the College in accordance with the regulations (see page 47).
8. He must have paid all outstanding bills and returned all equipment and library books.

Advanced Degrees

MASTER OF ARTS AND MASTER OF SCIENCE

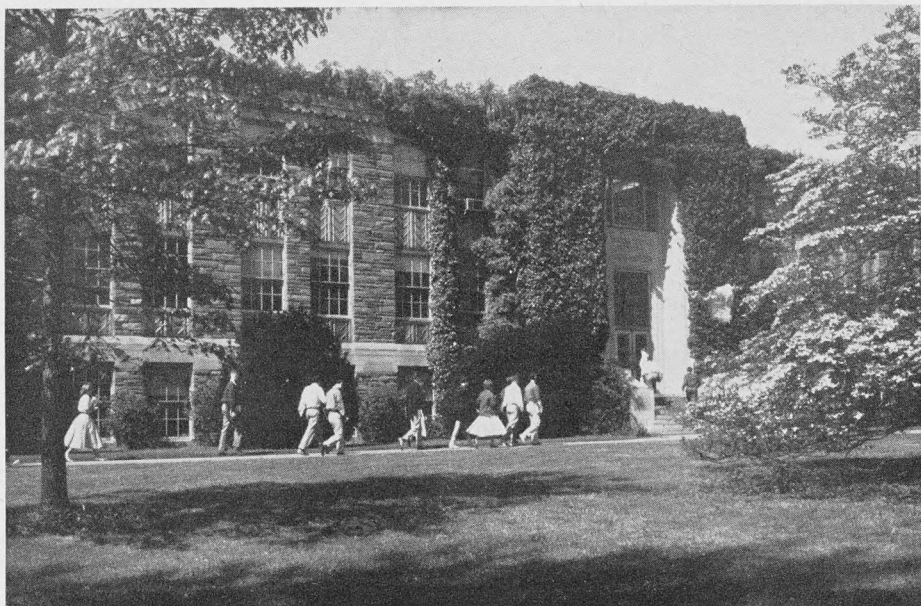
The degree of Master of Arts or Master of Science may be conferred subject to the following requirements:



Wharton Hall, a Dormitory for Men



Worth Dormitory for Women



Martin Biological Laboratory



Trotter Hall

Only students who have completed the work for the Bachelor's degree with some distinction, either at Swarthmore or at another institution of satisfactory standing, shall be admitted as candidates for the Master's degree at Swarthmore.

The candidate's record and a detailed program setting forth the aim of the work to be pursued shall be submitted, with a recommendation from the department or departments concerned, to the Committee on the Master's Degree. If accepted by the Committee, the candidate's name shall be reported to the faculty at or before the first faculty meeting of the year in which the candidate is to begin his work.

The requirements for the Master's degree shall include the equivalent of a full year's work of graduate character. This work may be done in courses, seminars, reading courses, regular conferences with members of the faculty, or research. The work may be done in one department or in two related departments. The catalogue statements of departments which offer graduate work indicate the courses or seminars which may be taken for this purpose.

A candidate for the Master's degree shall be required to pass an examination conducted by the department or departments in which his work was done. He shall be examined by outside examiners, provided that, where this procedure is not practicable, exceptions may be made by the Committee on the Master's Degree. The department or departments concerned, on the basis of the reports of the outside examiners, together with the reports of the student's resident instructors, shall make recommendations to the faculty for the award of the degree.

At the option of the department or departments concerned, a thesis may be required as part of the work for the degree.

A candidate for the Master's degree will be expected to show before admission to candidacy a competence in those languages deemed by his department or departments most essential for his field of research. Detailed language requirements will be indicated in the announcements of departments which admit candidates for the degree.

The tuition fee for graduate students who are candidates for the Master's degree is \$600 per year, and the general fee for these students is \$25 per semester.

ADVANCED ENGINEERING DEGREES

The advanced degrees of Mechanical Engineer (M.E.), Electrical Engineer (E.E.), and Civil Engineer (C.E.), may be obtained by graduates who have received their Bachelor's degree in Engineering upon fulfilling the requirements given below:

1. The candidate must have been engaged in engineering work for five years since receiving his first degree.

2. He must have had charge of engineering work and must be in a position of responsibility and trust at the time of application.

3. He must make application and submit an outline of the thesis he expects to present, one full year before the advanced degree is to be conferred.

4. The thesis must be submitted for approval one calendar month before the time of granting the degree.

5. Every candidate shall pay a registration fee of \$5 and an additional fee of \$20 when the degree is conferred.

Awards and Prizes

The JOHN W. NASON AWARD, a gift of a friend of the College in honor of the Eighth President, is presented, normally at Commencement, to one or more members of the total staff of the College, or to members of their families, who have made a distinctive contribution, beyond the scope of their normal duties, to the life of the College community. The Award is made by the Instruction and Libraries Committee of the Board of Managers upon the advice of the President of the College and consists of a formal citation and a monetary award of \$1,000.

The IVY AWARD FUND was created by a gift from Owen Moon, '94. The income of the fund is placed in the hands of the faculty for award on Commencement Day to a male member of the graduating class. The qualifications for the Ivy Award are similar to those for the Rhodes Scholarships and include (a) qualities of manhood, force of character, and leadership; (b) literary and scholastic ability and attainments. These have been phrased by the donor in the words "leadership based upon character and scholarship."

The OAK LEAF AWARD was established by David Dwight Rowlands of the Class of 1909. It was later permanently endowed in memory of him by Hazel C. Rowlands, '07, and Caroline A. Lukens, '98. The award is made by the faculty each year to the woman member of the Senior Class who is outstanding for loyalty, scholarship and service.

The MCCABE ENGINEERING AWARD, founded by Thomas B. McCabe, 1915, is to be presented each year to the outstanding engineering student in the Senior Class. The recipient is chosen by a committee of the faculty of the division of Engineering.

The CRANE PRIZE, a memorial to Charles E. Crane, Jr., of the Class of 1936, is an award of about \$20, given for the purchase of philosophical books, and presented annually to the junior who, in the opinion of the department, has done the best work in Philosophy and Psychology.

The A. EDWARD NEWTON LIBRARY PRIZE of \$50, endowed by A. Edward Newton, to make permanent the Library Prize first established by W. W.

Thayer, is awarded annually to that undergraduate who, in the opinion of the Committee of Award, shows the best and most intelligently chosen collection of books upon any subject. Particular emphasis is laid in the award not merely upon the size of the collection but also upon the skill with which the books are selected and upon the owner's knowledge of their subject-matter.

The KATHERINE B. SICARD PRIZE of \$5, endowed by the Delta Gamma Fraternity in memory of Katherine B. Sicard, '34, is awarded annually to the freshman woman who, in the opinion of the department, shows greatest proficiency in English.

PUBLIC SPEAKING CONTESTS. Prizes for annual contests in public speaking are provided as follows: The ELLA FRANCES BUNTING EXTEMPORARY SPEAKING FUND awards prizes totaling \$45 for the best extemporaneous short speeches. The OWEN MOON FUND provides the Delta Upsilon Speaking Contest prizes totaling \$25 for the best prepared speeches on topics of current interest.

The WILLIAM PLUMMER POTTER PUBLIC SPEAKING FUND was established in 1907. The income of the fund is used to sponsor three different annual contests: (1) the Potter Public Speaking Contest prizes totalling \$100.00, (2) the Potter Poetry Contest, \$50.00, (3) the One-Act Play Contest, \$50.00. The Potter Fund has also been used to establish a collection of dramatic and poetic records.

The LOIS MORRELL POETRY AWARD, given by her parents in memory of Lois Morrell of the Class of 1946, goes to that student who, in the opinion of the faculty, submits the best original poem in the annual competition for the award. The award, consisting of \$100, is made in the spring of the year. All entries should be submitted by April 1.

The JOHN RUSSELL HAYES POETRY PRIZES, of approximately \$25 for a first prize and \$15 for a second prize, are offered for the best original poem or for a translation from any language. Manuscripts should be ready by April 1 of each year.

Fellowships

Three fellowships are awarded annually by the faculty, on recommendation of the Committee on Fellowships, to graduates of the college for the pursuit of advanced work under the direction of the faculty or with their approval. Applications for fellowships must be in the hands of the committee by April 15. Applicants for any one of these fellowships will be considered for the others as well.

These three fellowships are:

The HANNAH A. LEEDOM FELLOWSHIP of \$500, founded by the bequest of Hannah A. Leedom.

The JOSHUA LIPPINCOTT FELLOWSHIP of \$600, founded by Howard W. Lippincott, of the Class of 1875, in memory of his father.

The JOHN LOCKWOOD MEMORIAL FELLOWSHIP of \$600, founded by the bequest of Lydia A. Lockwood, New York, in memory of her brother, John Lockwood. It was the wish of the donor that the fellowship be awarded to a member of the Society of Friends.

Four other fellowships are open to graduates of Swarthmore College under the conditions described below:

The LUCRETIA MOTT FELLOWSHIP, founded by the Somerville Literary Society and sustained by the contribution of its life members, has yielded an annual income since its foundation of \$525. It is awarded each year by a committee of the faculty (selected by the society), with the concurrence of the life members of the society, to a young woman graduate of that year who is to pursue advanced study at some other institution approved by this committee.

The MARTHA E. TYSON FELLOWSHIP, founded by the Somerville Literary Society in 1913, is sustained by the contributions of life members of the society and yields an income of \$500 or more. It is awarded biennially by a joint committee of the faculty and the society (elected by the society) with the concurrence of the life members of the society to a woman graduate of Swarthmore College, who has entered or plans to enter elementary or secondary school work. The recipient of the award is to pursue a course of study fitting her for more efficient work in an institution approved by the Committee of Award.

SIGMA XI RESEARCH FELLOWSHIP. The Swarthmore Chapter of Sigma Xi appoints, from time to time, as funds are available, Fellows with research grants with a maximum value of \$1,000. The holders of this fellowship are usually associates of the chapter who have shown conspicuous ability in graduate studies. The purpose of the chapter in awarding these fellowships is to relieve worthy students from teaching and other distracting duties so that they may concentrate as much as possible upon their research. Applications for these fellowships should be made to the secretary of the chapter not later than the middle of March. Appointments will be announced about the middle of April.

The PHI BETA KAPPA FELLOWSHIP of \$150, founded by the Swarthmore Chapter of the national honor fraternity, is awarded each year at the discretion of the Committee on Fellowships on the basis of intellectual distinction to a member of the senior class who proposes to pursue graduate study and scholarly work.

COURSES OF INSTRUCTION

NUMBERING OF COURSES AND SEMINARS

A system of uniform numbering is used in all departments. Courses are numbered as follows:

- 1 to 9—introductory courses
- 11 to 49—other courses open to students of all classes
- 51 to 69—advanced courses limited to juniors and seniors
- 101 to 199—seminars for honors students and graduate students

Full courses the numbers of which are joined by a hyphen (e.g., 1-2) must be continued for the entire year; credit is not given for the first semester's work only.

Astronomy

PROFESSOR: PETER VAN DE KAMP, *Chairman and Director of Sproul Observatory*

ASSISTANT PROFESSOR: ARNE A. WYLLER‡

RESEARCH ASSOCIATE: SARAH L. LIPPINCOTT

RESEARCH ASSISTANT: LAURENCE W. FREDRICK

Astronomy deals with the nature of the universe about us and the methods employed to discover the laws underlying the observed phenomena. The elementary courses present the problems in broad outlines and trace the growth of our knowledge of the facts and the development of more comprehensive theories. The advanced courses consider some of these problems in detail; the order in which they may be taken depends upon the extent of the student's mastery of mathematics and physics.

The principal instrument of the Sproul Observatory is the twenty-four-inch visual refractor of thirty-six-foot focal length, used almost exclusively for photography. The instrument has been in continuous operation since 1912 and provides a valuable and steadily expanding collection of photographs. A number of measuring and calculating machines are available for the measurement and reduction of the photographs. The principal program of the Observatory is an accurate study of the distances, motions and masses of the nearer stellar systems.

Advanced study in conjunction with the research program of the Observatory may be arranged in consultation with the Director of the Sproul Observatory. The Students' Observatory contains a six-inch visual refractor, a nine-inch photographic telescope, and a transit instrument. The Sproul Observatory is open to visitors on the second and fourth Tuesday nights of each month, except those Tuesday nights that fall in a vacation period. Visitors thus have an opportunity of seeing, in the course of a year, many celestial objects of various types.

1-2. DESCRIPTIVE ASTRONOMY. Mr. van de Kamp. *Full Course*

These courses provide an introduction to the methods and results of astronomy. Fundamental notions of physics are studied as they are needed to provide an adequate scientific basis for the course. These courses are prerequisite for all further work in astronomy. Three class periods each week, practical work to be arranged.

3. INTRODUCTION TO MATHEMATICAL ASTRONOMY. Mr. van de Kamp.

Spherical astronomy; celestial navigation. The two body problem; energy concepts; Bohr atom. Galactic rotation. Other problems.

11. DOUBLE STARS. Mr. van de Kamp.

The two body problem. Theory and observational technique of visual, spectroscopic and eclipsing binaries. Special attention is given to the photographic study of both resolved and unresolved astrometric binaries. The masses of binary components and of unseen companions.

Prerequisite: Mathematics 11-12.

‡ Absent on leave, 1957-58.

12. PHOTOGRAPHIC ASTROMETRY. Mr. van de Kamp.

The long-focus refractor. Photographic technique, measurement and reduction of photographic plates. Choice of reference stars. Attainable accuracy. Application to the problems of parallax, proper motion, mass-ratio, and perturbations. Resolved and unresolved astrometric binaries; orbital analyses.

Prerequisites: Mathematics 3-4, and Astronomy 1-2.

13. INTRODUCTORY ASTROPHYSICS. Mr. Wyller.

Selected topics in atomic physics and theory of radiation with subsequent applications to the problems of absorption lines and radiative transfer in stellar atmospheres.

Prerequisite: Mathematics 11-12.

14. GALACTIC AND EXTRAGALACTIC STRUCTURE. Mr. van de Kamp. *Spring Semester*

Fundamental data. Interstellar matter, nebulae, stars. Variable stars. Structure and rotation of the galactic system. Extragalactic objects. The concept of populations. Age, origin and evolution of the universe.

Prerequisites: Mathematics 3-4, and Astronomy 1-2.

15. READING COURSE IN ASTRONOMY. Mr. van de Kamp.

Extensive and detailed study of the literature of various fields and topics.

Students who intend to pursue astronomy as a major subject in course should have Astronomy 1-2 during the freshman or sophomore year; advanced courses in Astronomy selected from the list given above, combined with work in mathematics, constitute the further requirement.

HONORS SEMINARS IN ASTRONOMY

Prerequisites for admission to honors seminars in Astronomy, either as a major or as a minor, are the completion of the following courses: Mathematics 11-12, Astronomy 1-2, a course in general Physics, reading knowledge of French or German.

101. DOUBLE STARS.

102. PHOTOGRAPHIC ASTROMETRY.

103. ASTROPHYSICS.

104. GALACTIC AND EXTRAGALACTIC STRUCTURE.

105. ECLIPSING BINARIES.

106. OPTICS (IDENTICAL WITH PHYSICS 101).

110. THESIS. Mr. van de Kamp, staff.

Participation in a research project of Sproul Observatory.

GRADUATE WORK

In conformity with the general regulations for work leading to the Master's degree (see page 64), this department offers the possibility for graduate work.

Candidates for the Master's degree will normally take four honors seminars, selected from those listed in astronomy, mathematics or physics, in consultation with the faculty member under whose direction the work is to be done. A thesis may be substituted for one of the seminars.

Candidates for the Master's degree must have a good reading knowledge of two modern languages.

Biology

PROFESSOR: ROBERT K. ENDERS, *Chairman*

ASSOCIATE PROFESSORS: LAUNCE J. FLEMISTER

LUZERNE G. LIVINGSTON

NORMAN A. MEINKOTH‡

NEAL A. WEBER

ASSISTANT PROFESSOR: KURT K. BOHNSACK‡

INSTRUCTORS: WILLIAM C. DENISON, HAROLD G. KLEIN

LECTURER: SARAH C. FLEMISTER

Through its elementary course, the Department of Biology introduces the student to a comprehensive view of those principles, problems and phenomena common to all organisms, with animals and plants interpreted on a comparative basis. The advanced courses in the Biological Sciences (except Genetics) deal specifically with plant biology (botany), or animal biology (zoology) and are listed under these respective headings.

Following the broad review of the plant and animal kingdoms as given in the course in general biology, advanced work is taken up in two different ways: first, specific aspects of the broad subjects are treated in a comparative manner as in anatomy and physiology; second, broader aspects of a specific subject are treated as in entomology, parasitology, embryology, genetics and developmental plant anatomy. The structural and functional consideration is extended to include problems of interdependence of organisms in the structure and function of plant and animal societies and the influence of physical, chemical and biological factors in the survival of those societies.

REQUIREMENTS FOR MAJORS IN COURSE

A student may major in biology, botany, or zoology. Students in course should include the following supporting subjects in their programs, in addition to the four full courses in their major subject: chemistry, including one semester in organic chemistry, one course in physics, one course in mathematics and a modern language (German preferred) through course 4. These courses are required for majors in botany or zoology. The program for biology majors may be modified, but any program must be approved in advance by the department.

Biology

1-2. GENERAL BIOLOGY. Staff.

Full Course

An introduction to the study of living things. A consideration of the properties of protoplasm and the structure of the cell; a brief survey of living forms, both plant and animal. The methods by which animals and plants maintain themselves, grow and reproduce, and a discussion of the mechanism of heredity. Some time will be devoted to the interrelationships of plants and animals in communities, and the place of man in the whole structure. Evidence for and against theories of evolution will be discussed.

Two lectures and one discussion period, one three-hour laboratory per week.

Credit is not given for a single semester of this course.

‡ Absent on leave, 1957-58.

20. GENETICS. Mr. Denison.

Spring Semester

A study of the fundamental principles of inheritance as they apply to living organisms generally. The course includes a detailed consideration of the principles of Mendelian inheritance, an analysis of the underlying chromosomal mechanisms, the gene theory, and the relationship of the principles of genetics to evolution, to plant and animal improvement, and to man.

Three lectures per week, with assigned problems and laboratory and/or library projects in lieu of formally organized laboratory work.

Prerequisite: Biology 1-2.

Botany

16. DEVELOPMENTAL PLANT ANATOMY. Mr. Livingston.

Alternate Years, Fall Semester

The fundamentals of anatomy of seed plants approached from a developmental standpoint. The structure and behavior of meristems, problems and processes of differentiation, and a detailed analysis of cellular, tissue and organ structure in higher plants.

Two lectures and two three-hour laboratory periods per week.

Prerequisite: Biology 1-2.

18. SURVEY OF THE PLANT KINGDOM. Mr. Livingston, Mr. Denison.

Alternate Years, Fall Semester

A comparative study of the structure, reproduction, and life habits of the algae, fungi, mosses, and lower vascular plants from a phylogenetic viewpoint. Particular attention is given to current concepts of evolutionary relationship from the standpoints of both comparative morphology and paleobotanical evidence.

Two lectures and two laboratories or field trips per week.

Prerequisite: Biology 1-2.

65. FIELD BOTANY. Mr. Denison.

Alternate Years, Spring Semester

A study of the classification of the principal groups of plants emphasizing field identification and economic, biological and cultural significance. The final lectures are concerned with the fundamentals of plant ecology.

Three lectures, one field trip, and one laboratory per week plus one or more weekend field trips.

Prerequisite: Biology 1-2.

67. PLANT PHYSIOLOGY. Mr. Livingston.

Alternate Years, Spring Semester

An integrated study of the physiological processes of higher plants, including general cellular physiology, water relations, mineral nutrition, enzyme action, photosynthesis, metabolic processes, translocation, the physiology of growth and development, and related topics.

Two lectures, one discussion period, and one laboratory period per week.

Prerequisites: Biology 1-2, Chemistry 1-2, Organic Chemistry desirable.

68. BIOLOGY OF BACTERIA. Mr. Livingston.

Alternate Years, Fall Semester

An approach to the study of bacteriology with principal emphasis on the consideration of bacteria as organisms, rather than as causative agents of disease, etc. The morphology, physiology and biochemistry, and classification of bacteria.

Two lectures and two laboratory periods per week.

Prerequisites: Biology 1-2, Chemistry 1-2, Organic Chemistry desirable.

69. TAXONOMY OF SEED PLANTS. Mr. Denison.

Alternate Years, Spring Semester

A study of the principal families of seed plants emphasizing those forms occurring naturally or under cultivation in the temperate and subtropical portions of eastern North America. The fundamentals of systematics are discussed but not stressed.

Three lectures, one field trip, and one laboratory period per week.

Prerequisite: Biology 1-2.

Botany 65 and 69 are intended as alternative courses. Students who have taken one course may not ordinarily take the other for credit.

HONORS WORK

The seminars given each year vary according to the choices of the students and the convenience of the department.

111. PLANT PHYSIOLOGY. Mr. Livingston.

An extension of the area covered in course 67, with particular emphasis on a critical study of original sources, both classical and current. The seminar discussion is accompanied by a full day of laboratory work each week.

112. PROBLEMS OF PLANT GROWTH AND DEVELOPMENT. Mr. Denison and Mr. Livingston.

A correlated anatomical and physiological approach to developmental plant anatomy and morphogenesis. The seminar discussion is accompanied by a full day of laboratory work each week.

113. GENETICS. Mr. Denison.

An extension of the area covered in course 20, with particular emphasis on current research in the field of inheritance in all its aspects. The seminar discussion is accompanied by a full day of laboratory work each week.

114. TAXONOMY AND DISTRIBUTION OF FLOWERING PLANTS. Mr. Denison.

An extension of the area covered in course 68. Particular emphasis is placed on geography and distribution. Seminar discussions and field work, supplemented by laboratory work.

115. MICROBIOLOGY. Mr. Livingston.

An extension of the area covered in Course 68. Particular emphasis is placed on physiological and biochemical aspects of the subject. Some work on fungi and viruses is included.

Zoology

11. COMPARATIVE VERTEBRATE ANATOMY. Mr. Weber.

Fall Semester

This course normally follows General Biology. It deals with the comparative and unique aspects of the anatomy of the integument, skeleton, muscular, digestive, respiratory, circulatory, excretory, reproductive and nervous systems of the various vertebrate types. Classification, phylogeny and adaptive radiation are considered with stress placed on anatomical adaptations to the various habitats. The protochordates, lamprey, dogfish, necturus and cat are studied as representative forms in the laboratory. The course has three lecture and two laboratory meetings per week. This course is among those required by medical schools.

12. VERTEBRATE PHYSIOLOGY. Mr. Flemister. *Spring Semester*
 A general consideration of the functional process in animals with emphasis placed on mammals and other vertebrates. The aspects of adaptation of the animal to environmental stress are treated in such a way as to serve the individual student's area of concentration. In preparation the introductory course in Biology is desirable. Two lectures, one conference and one laboratory period per week.
51. HISTOLOGY. Mrs. Flemister. *Fall Semester*
 This course consists of a detailed study of the microscopic structure of vertebrate tissues, together with the functions of such tissues. In the laboratory the student examines both prepared and living material, and becomes familiar with the principles of microtechniques. Three lectures and two laboratory periods per week.
 Prerequisites: 1-2, 11.
52. EMBRYOLOGY. Mrs. Flemister. *Spring Semester*
 A study of development of vertebrate anatomy. The lectures are concerned with an investigation of the events which precede development, an analysis of the development processes, and a brief survey of the contributions of the field of experimental embryology. Laboratory periods are devoted to the embryology of the frog, chick and pig. Three lectures and two laboratory periods per week.
53. ENTOMOLOGY. Mr. Weber. *Spring Semester*
 The study of insects and their relatives, their morphological and physiological adaptations and their effect on man. Each student will prepare a study collection from field trips.
54. BIOLOGY OF PARASITISM. *Alternate Years, Spring Semester*
 A consideration of parasitology with reference to evolution and adaptation to the parasitic habit. Surveys are made of parasites in native animals. Classification, life cycles and epidemiology are reviewed.
 Prerequisite: 11 Comparative Vertebrate Anatomy.
55. FIELD ZOOLOGY. Mr. Weber. *Fall Semester*
 Emphasis is on the living animals as they occur in nature, their systematics, relationships to the environment, habits and distribution. Most of the work will be done on field trips.
56. INVERTEBRATE ZOOLOGY. *Alternate Years, Fall Semester*
 A course designed to acquaint the student with the fundamental morphology, classification, phylogeny and special problems of the invertebrate phyla.
 Three lectures and one laboratory period per week. Occasional field trips.
 Prerequisite: 11 Comparative Vertebrate Anatomy.
57. COMPARATIVE PHYSIOLOGY. Mr. Flemister. *Fall Semester*
 A course of lectures and laboratory experiments treating functional processes from the standpoint of adaptation of the animal to its environment. These processes in representative animals are compared in order to follow their elaboration from the more general to the more specialized.
 Two lectures, one conference and two laboratory periods per week.
 Prerequisites: Comparative Anatomy and Organic Chemistry.
58. PHYSIOLOGICAL ECOLOGY. Mr. Flemister. *Spring Semester*
 A course of lectures, discussions and experiments concerning the physiological adaptations of representative animals to environmental stress. Requirements and availability of optimum conditions of temperature, oxygen, food-stuffs and the maintenance of ionic independence are critically appraised.
 Two lectures, one conference and two laboratory periods per week.
 Prerequisite: 57 Comparative Physiology. Offered Spring term of even years.

59. **CYTOLOGY.** Mrs. Flemister. *Alternate Years, Fall Semester*
 A study of the structure and function of cells as units of biological organization, and relationships within tissues and organs. In the laboratory the student learns some of the techniques by which information about cells is arrived at, and observes the characteristics of cells as units, and as parts of organized tissues. Three lectures and two laboratory periods per week.
 Prerequisites: Biology 1-2, Biology 11, Chemistry 1-2.
- 61 **BIOLOGY FOR SENIORS.** Mr. Enders. *Spring Semester*
 A course designed to integrate the student's knowledge in abstract sciences with living animals, both captive and wild, and to give an opportunity to work on some phase of Biology of interest to him.
- 63, 64. **SPECIAL TOPICS.** Staff. *Full or Half Course*
 For advanced students. Open to those who, on account of fitness, have arranged a program of special work in the department.
- 70-71. **FUNDAMENTALS OF SYSTEMATICS.** Academy of Natural Sciences.
 This course presents the study of variation, speciation, and the evolution of taxonomic categories. It acquaints the student with the use of the methods and techniques of cytology, genetics, statistics, and plant and animal distribution in solving taxonomic problems. Each student will attack an individual problem in the taxonomy of some group of plants or animals.
 One hour lecture, 4 hours laboratory. Saturdays 8-1.

HONORS WORK

Honors students majoring in Zoology must take four seminars in the department and a minor of two seminars in another department within the division. Some freedom is offered in the selection of the two seminars, or four half courses, which normally would fulfill a second minor.

Students anticipating an honors program in Zoology must complete in the first two and a half years the following: Biology 1-2 and Zoology 11, Chemistry 1-2, Mathematics 3-4, and Physics 1-2. In addition, to qualify for minor seminars in the departments indicated, Chemistry requires Chemistry 28-29, Mathematics requires Mathematics 11-12, Physics requires Physics 11-12 and Mathematics 11-12, and Psychology requires Psychology 1, and another half course.

Prerequisites for students in the Honors Program with a minor in Zoology consist of three half courses in Biology and Zoology (including 1-2). In addition, 104 requires a full course in Physics and a half course in Organic Chemistry.

Seminars: The following seminars prepare students for examinations for a degree with Honors.

101. **BIOLOGY OF PARASITISM.**
 An intensified version of course 54 with emphasis on individual student projects, and an acquaintance with both the classic problems and the current literature dealing with the phenomenon of parasitism.
102. **CYTOLOGY.** Mrs. Flemister.
 A study of the structure and function of the cell. Living material will be examined and the modern microscopical techniques employed in the laboratory.
103. **EMBRYOLOGY.** Mr. Enders.
 An analysis of reproduction and development. The laboratory work includes individual projects by the students, a study of developmental anatomy of the chick, pig and frog, and the observation of living material under normal and experimental conditions.

104. COMPARATIVE PHYSIOLOGY. Mr. Flemister.

An intensive consideration of the physical and chemical phenomena underlying the function of animals. A comparative approach is maintained in order to consider the progression from more general to the most specialized adjustments, acclimatizations and adaptations of animals to physical, chemical and biological stresses in the environment. The terminal portion of the laboratory program is devoted to the pursuit of original, independent work by the student. Prerequisites for this seminar are courses in Comparative Anatomy and Organic Chemistry. Offered in the Fall term.

106. ENTOMOLOGY. Mr. Weber.

Following a survey of insects in general, a detailed study of one aspect of the field will be undertaken. This will involve use of a scientific library and independent work on one topic.

107. INVERTEBRATE ZOOLOGY.

A study of the morphology, taxonomy, natural history, distribution and adaptation of invertebrate phyla with special emphasis on evolutionary trends, ecological relations, and problems peculiar to each group.

110. SPECIAL TOPICS. The Staff.

Open to students who, having satisfied all requirements, desire further work in the department. Frequently this will include acting as junior assistants in the research of staff members.

Chemistry

PROFESSORS: EDWARD H. COX, *Chairman*

WALTER B. KEIGHTON, JR.

ASSOCIATE PROFESSORS: EDWARD A. FEHNEL

DUNCAN G. FOSTER

GILBERT P. HAIGHT, JR.

The aim of the Department of Chemistry is to provide a sound training in the fundamental theories and basic techniques of the science rather than to deal with specialized branches of the subject.

Both lecture and seminar approaches are used in presenting the subject matter. The techniques and practices of the science are dealt with during the laboratory periods. Usually the course laboratory periods last from three to four hours.

The various courses and seminar offerings are designed to meet the needs of three classes of students:

1. Students with a primary interest in the humanities or social sciences, who turn to chemistry as a scientific study of general educational value. Chemistry 1, 2 offers training in the scientific approach to problems, experience with the laboratory method of investigation, and a presentation of some of the major intellectual achievements of chemistry.
2. Students who seek training in chemistry as a supplement to their study of astronomy, botany, engineering, mathematics, medicine, physics, or zoology. These students should consult with their major department and with the Chemistry department concerning the chemistry courses most suitable to their needs.
3. Students who consider chemistry their major interest. These students will take Chemistry 1, 2 and Mathematics 3-4 in their freshman year; Chemistry 28 and 29, Mathematics 11, 12 and Physics 1, 2 in their sophomore year; Chemistry 26, 27 in their junior year, and Chemistry 61, 62 in their senior year. Some students interested in Chemistry as a scientific study of general educational value, but with no intention of pursuing chemistry as a profession, will find these basic courses sufficient for their needs. Others, including those who expect to practice chemistry as a profession, will take, in addition to the above courses, Mathematics 51, 52 and Physics 11, 12 in their junior year, and in the senior year, Chemistry 56 and 65. This latter curriculum—together with the general college requirements outlined on pages 54 to 57—satisfies the minimum requirements of the American Chemical Society for professional training in chemistry. Major students are expected to have a reading knowledge of German before graduation.*

* Students who have completed the foreign language requirement in another language may satisfy this requirement by taking German 7-8.

1. **INTRODUCTORY CHEMISTRY.** Mr. Haight and Staff. *Fall Semester*
A study of the central concepts and basic principles of chemistry, including atomic theory, kinetic-molecular theory, atomic structure, the kinds of chemical change and the laws governing them. The chemistry of the non-metals will be introduced. No previous training in chemistry is required. Students who enter college with exceptional training in chemistry are encouraged to take a placement examination during freshman orientation week. If found to be sufficiently well prepared they may omit all or part of the introductory course.
One semester. Prerequisite for all other courses in Chemistry.
Three lectures or recitations and one laboratory period weekly.
2. **INTRODUCTORY CHEMISTRY.** Mr. Haight and Staff. *Spring Semester*
This course is a continuation of Chemistry 1, with particular attention to the development and application of the principles studied in Chemistry 1. Emphasis will be laid on the use of the periodic classification of the elements and the chemistry of the elements. The laboratory will be given over to the application of the principles of chemical equilibrium to qualitative analysis.
One semester. Prerequisite: Chemistry 1.
Three lectures or recitations and one laboratory period weekly.
11. **ELEMENTARY PHYSICAL CHEMISTRY.** Mr. Keighton. *Fall Semester*
This is a one-semester course dealing with elementary kinetics, equilibrium, the chemistry of solutions and the colloidal state. This course is terminal, designed for students who are not majoring in chemistry or who do not require the more intensive study of physical chemistry provided by Chemistry 61-62.
One semester. Prerequisite: Chemistry 2, Mathematics 2.
Three lectures or recitations weekly.
25. **ORGANIC CHEMISTRY SURVEY.** Mr. Cox. *Spring Semester*
A one-semester survey of the field of organic chemistry with special emphasis on nomenclature, structural relationships and general reactions of the more important classes of aliphatic and aromatic compounds. No attempt is made to solve intricate problems in syntheses. This course is terminal, designed for students who are not majoring in chemistry or for students who do not require the more intensive study of organic chemistry provided by Chemistry 28-29.
One semester. Prerequisite: Chemistry 2.
Two lectures, one conference and one laboratory period weekly.
26. **QUANTITATIVE ANALYSIS I.** Mr. Foster. *Fall Semester*
The theory and practice of volumetric analysis. Acid-base, oxidation-reduction, precipitation and complex formation methods are studied, and the application of the laws of chemical equilibrium to analytical methods. Laboratory work consists in the analysis of unknowns illustrating these principles.
This course may be taken as a terminal course by students for whom only one semester of analytical chemistry is required (e.g., pre-medical students).
One semester. Prerequisite: Chemistry 2.
Two lectures or conferences and two laboratory periods weekly.
27. **QUANTITATIVE ANALYSIS II.** Mr. Foster. *Spring Semester*
The theory and practice of gravimetric analysis. Separation methods, coprecipitation, electrolysis, photometry, some aspects of instrumentation and an introduction to gas analytical methods are studied, with illustrative unknowns and laboratory exercises.
One semester. Prerequisite: Chemistry 26.
Two lectures or conferences and two laboratory periods weekly.

- 28-29. ORGANIC CHEMISTRY. Mr. Cox and Mr. Fehnel. *Full Course*
 This course is designed for chemistry majors and others who require more thorough training in the principles and practice of organic chemistry than is given by Chemistry 25. It is a prerequisite for admission to the Honors Seminar in Organic Chemistry. The first semester is devoted largely to a consideration of aliphatic compounds and the second to aromatic compounds. In addition, some elementary aspects of the chemistry of alicyclic and heterocyclic compounds, biologically interesting materials, dyes and plastics are included. Synthetic methods in organic chemistry are emphasized.
 Two semesters. Prerequisite: Chemistry 2.
 Three lectures and one laboratory period weekly.
56. ADVANCED ORGANIC CHEMISTRY. Mr. Fehnel. *Fall Semester*
 Selected topics in organic chemistry, including resonance and molecular orbital theory, reaction mechanisms, molecular rearrangements, stereochemistry, free radicals and other topics of current interest. The laboratory periods are devoted to qualitative organic analysis and to library and problem work in connection with the identification and characterization of organic compounds.
 One semester. Prerequisite: Chemistry 28-29.
 Three lectures and two laboratory periods weekly.
- 61-62. PHYSICAL CHEMISTRY. Mr. Keighton. *Full Course*
 The principles of theoretical chemistry are studied and a number of numerical exercises are worked; the gaseous, liquid and solid states, solutions, colloids, elementary thermodynamics, chemical equilibria, electrochemistry, the kinetics of chemical reactions. In the laboratory the student uses a variety of physical-chemistry apparatus.
 Prerequisites: Quantitative analysis, calculus, and general physics.
 Three lectures and one laboratory period weekly.
65. ADVANCED INORGANIC CHEMISTRY. Mr. Haight. *Spring Semester*
 The periodic classification of elements is studied from the point of view of correlation of structure and properties. Consideration is given to such topics as atomic and molecular structure, coordination complexes, metal carbonyls, intermetallic and interstitial compounds, modern concepts of acids and bases, chemistry of the transition metals and rare earths and other phases of inorganic chemistry.
 One semester. Prerequisite: Chemistry 61 either previously or concurrently.
 Three lectures or conferences weekly.
69. SPECIAL TOPICS. Staff. *Fall and Spring Semesters*
 An elective half-course which provides an opportunity for qualified advanced students to undertake original investigations in the field of chemistry. The course is designed to give the student practical experience in the application of the scientific method to the solution of a research problem, to develop facility in the use of advanced laboratory techniques, and to stimulate interest in current developments in chemical research. A thesis is required in lieu of a final examination. Students who propose to take this course should consult the appropriate instructor.
 One semester.
 Approximately ten hours of laboratory work and conferences weekly.

HONORS WORK

Before admission to honors work the chemistry major will have completed Chemistry 1, 2, 28, 29, Mathematics 3, 4, 11, 12, and Physics 1, 2. The honors program includes Chemistry 101, 105 in the junior year and Chemistry 106 and either 102 or 107 in the senior year, with four other seminars usually in biology, mathematics, or physics.

101. PHYSICAL CHEMISTRY. Mr. Keighton. *Each Semester*

The gaseous, liquid, and solid states, solutions, colloids, elementary thermodynamics, chemical equilibria, electrochemistry, the kinetics of chemical reactions. Prerequisites: Quantitative analysis, calculus, and general physics.

One four-hour seminar and one seven-hour laboratory period weekly for one semester.

102. ADVANCED PHYSICAL CHEMISTRY. Mr. Keighton. *Spring Semester*

Topics such as the following: thermodynamics, the Debye-Hückel theory of strong electrolytes, the structure of matter, chemical kinetics including photochemistry and acid-base catalysis.

Prerequisite: Physical Chemistry 61-62, or 101.

One four-hour seminar and one seven-hour laboratory period weekly.

105. QUANTITATIVE ANALYSIS. Mr. Foster. *Fall Semester*

Essentially the content of courses 26 and 27, designed to prepare honors candidates for an honors examination.

Prerequisite: Chemistry 2.

One seminar and six hours of laboratory work weekly.

106. ADVANCED ORGANIC CHEMISTRY. Mr. Fehnel. *Fall Semester*

A more intensive study of the same general area covered in Chemistry 56, including laboratory work in qualitative organic analysis.

Prerequisite: Chemistry 29 and senior standing.

One seminar and six hours of laboratory weekly.

107. ADVANCED INORGANIC CHEMISTRY. Mr. Haight. *Spring Semester*

A more intensive study of the same general area covered in Chemistry 65.

Prerequisite: Physical Chemistry either previously or concurrently.

One seminar and six hours of laboratory weekly.

Classics

PROFESSORS: L. R. SHERO, *Chairman*

SUSAN P. COBBS

ASSOCIATE PROFESSOR: HELEN F. NORTH

The Department of Classics offers courses in Greek and Latin that are designed to develop a capacity for the fruitful study of works written in those languages. A knowledge of Greek is particularly valuable for students of modern literature, philosophy, or the Christian religion; a knowledge of Latin, for students of the romance languages, mediaeval history, or law. Study in either field is helpful for the broadening and deepening of a student's educational experience.

Another group of courses (numbered from 31 on) deals with the history of the Greeks and Romans and with various aspects of their culture that have been of special significance for the modern world. These courses presuppose no knowledge of the Greek or Latin languages and are open without prerequisites to all students.

REQUIREMENTS AND RECOMMENDATIONS FOR MAJORS

Greek or Latin may be offered as the major subject either in course or in honors work. Major students in course are normally required to complete during the first two years either Intermediate Greek (course 11-12) or Introduction to Latin Literature (course 11-12). Both of these courses are prerequisite for honors seminars for a major student and one of them for honors seminars for a minor student.

Major students in Honors work may substitute for one of the four seminars normally required in this department the seminar in Ancient Philosophy given by the Department of Philosophy or the seminar in Linguistic Science or a thesis. Students of Latin may substitute a seminar in Greek for one of their seminars in Latin (or vice versa).

Greek

- 1-2. ELEMENTARY GREEK. Miss Cobbs. *Full Course*
The essentials of Greek grammar are covered and easy selections from Greek literature are read.
- 11, 12. INTERMEDIATE GREEK. Mr. Shero. *Full Course*
Selections from Homer, a play of Euripides, and Plato's *Apology* are read.
- 13, 14. GREEK READING. Miss North. *Full Course*
The reading of some of the masterpieces of poetry and of prose, including selections from lyric poetry and from Herodotus and a play of Aeschylus or Sophocles, is supplemented by a survey of the history of Greek Literature. Credit is given for each semester. The course will be offered only when required.
- 15, 16. ADVANCED GREEK READING. Mr. Shero. *Full Course*
The works read are determined by the interests and needs of the members of the class but will usually include portions of Thucydides, some speeches of the Attic orators, and a comedy of Aristophanes. Credit is given for each semester. The course will be offered only when required.

Latin

- 1-2. ELEMENTARY LATIN. Mr. Shero. *Full Course*
The course is designed for students who begin Latin in college or who are not prepared to enter Intermediate Latin, and it normally covers the equivalent of two years' work in secondary school. The course will be offered only when required.
- 3, 4. INTERMEDIATE LATIN. Miss North. *Full Course*
The course is primarily concerned with the reading of Virgil's *Aeneid*. For the benefit of students who have had only two years of preparatory Latin, a brief introductory period is devoted to a review of the fundamentals of Latin grammar. Credit is given for each semester.
- 11, 12. INTRODUCTION TO LATIN LITERATURE. Mr. Shero, Miss North. *Full Course*
The course aims to give some conception of the scope and characteristic qualities of Latin literature. The reading includes selections from comedy and from Cicero's essays in the first semester and the *Odes* of Horace in the second. Credit is given for each semester. It is open to students who have had four years of preparatory Latin or who have completed Intermediate Latin.
13. CATULLUS AND ELEGY. Miss Cobbs. *Fall Semester*
A study of the poems of Catullus and the elegiac poets.
14. MEDIAEVAL LATIN. Miss North. *Spring Semester*
The reading done in this course consists of prose and verse selected chiefly from the writings of mediaeval Latin authors, with particular emphasis on history, philosophy, satire, and poetry. Some attention is given, early in the course, to Christian authors, such as Minucius Felix, St. Jerome, and St. Augustine, in order to clarify the transition from ancient to mediaeval modes of thought and expression.

Ancient History and Civilization

31. HISTORY OF GREECE. Mr. Shero. *Fall Semester*
The course is devoted to the study of the political and social history of the Greek states to the time of the Hellenistic kingdoms. This is preceded by a brief survey of the Oriental civilizations by which the Greeks were influenced. Special attention is given to the 6th and 5th centuries B. C. Considerable reading is done in the primary sources in translation. The course is normally given in alternate years.
33. GREEK CIVILIZATION. Mr. Shero. *Fall Semester*
Special stress is laid on those aspects of Greek culture which have had most significance for the modern world, and a detailed study is made of some of the masterpieces of Greek art and of Greek literature (in translation). The course is given when there is sufficient demand.
34. HISTORY OF ROME. Mr. Shero. *Spring Semester*
The course is devoted to the study of the political and social history of Rome to the time of Constantine. Special attention is given to the last century of the Republic and the first century of the Empire. Considerable reading is done in the primary sources in translation.
35. CLASSICAL ARCHAEOLOGY. Mr. Shero.
The methods of archaeological investigation in general and the contributions of archaeology to our knowledge of Greek and Roman life and art are studied. A visit is paid to the University of Pennsylvania Museum. The course is given when there is sufficient demand.

36. GREEK LITERATURE IN TRANSLATION. Miss North. *Spring Semester*
 The works read in this course include the *Iliad* and the *Odyssey*, much of Greek tragedy and comedy, selections from the historians, the lyric and elegiac poets, and the Ionian physicists, and, in its entirety, the *Republic* of Plato. These works are considered both from the point of view of literary criticism and in relation to their influence on the development of western thought.
37. LATIN LITERATURE IN TRANSLATION—CLASSICAL AND MEDIAEVAL. Miss North. *Fall Semester*
 The works studied in this course range in time from the age of the Roman Republic to the twelfth century after Christ and are selected from those masterpieces written in the Latin language, which possess significance for the history and literature of Western Europe, and which retain their value when read in translation. They include, from the classical period, such major authors as Cicero, Lucretius, Virgil, Livy, and Seneca; from the Latin Fathers, St. Jerome and St. Augustine; and from the Middle Ages, Boethius, Prudentius, Bede, the chief figures of the Carolingian Renaissance, and the writers of Mediaeval Latin hymns and secular poetry. The course is given when there is sufficient demand.
39. CLASSICAL MYTHOLOGY IN LITERATURE AND ART. Mr. Shero. *Fall Semester*
 The course is designed to give familiarity with those myths and legends that have served as material for writers and artists from ancient times to the present. Plays, both ancient and modern, based on the more influential myths are read, and a study is made of the manner in which the themes have been handled in painting and sculpture of various periods. Special attention is given to the use made of stories from mythology by recent writers. The course is normally given in alternate years.

HONORS SEMINARS

01. LATIN LANGUAGE. Miss North.
 This seminar serves as an introduction to classical philology, stressing the study of the Latin language in its development from Indo-European to the Vulgar Latin period. It also includes practice in reading and writing Latin, and an introduction to epigraphy and palaeography. The seminar is given in the fall semester.
102. LATIN HISTORIANS. Mr. Shero.
 This seminar combines a survey of Latin historical writing to the end of the Silver Age with intensive study of selected books of Livy and Tacitus. The seminar is given in the spring semester.
103. LATIN EPIC. Miss North.
 This seminar traces the development of Roman epic poetry, with particular emphasis on the *De Rerum Natura* of Lucretius and the *Aeneid* of Virgil. Some attention is also given to early Roman epic, as represented by the *Annales* of Ennius, and to the period of its decline, typified by Lucan's *Pharsalia*. The seminar is given in the fall semester.
104. LATIN COMEDY AND SATIRE. Mr. Shero.
 Representative comedies of Plautus and Terence are read, and a study of the *Satires* and *Epistles* of Horace and the *Satires* of Juvenal is supplemented by a general survey of the development of Roman satire. The seminar is given in the spring semester.

In addition, seminars in Greek literature and in particular periods of ancient history will be offered when required. Seminars in the Greek Epic (113) and in the Greek Historians (112) will be offered in the year 1957-58. Seminars in the Greek Philosophers (111) and in the Greek Drama (114) will probably be offered in the following year.

Economics

PROFESSORS: CLAIR WILCOX, *Chairman*

EDWARD K. CRATSLEY

FRANK C. PIERSON ‡

ASSOCIATE PROFESSORS: JOSEPH W. CONARD

WILLIS D. WEATHERFORD

ASSISTANT PROFESSORS: WARREN E. ADAMS

WILLIAM H. BROWN, JR.

LECTURER: HELEN M. HUNTER

The courses in economics are designed: first, to acquaint the student with the institutions and the processes through which the business of producing, exchanging, and distributing goods and services is organized and carried on; second, to train him in the methods by which the operation of these institutions and processes may be analyzed; and third, to enable him to arrive at informed judgments concerning relevant issues of public policy.

Course 1-2 is prerequisite to all other work in the department except course 3. Students intending to major in economics are normally required to take either course 3 or 4 and are also advised to take Political Science 1-2. Sophomores are not permitted to take courses 50 to 61, inclusive, unless they will be unable to fit them into their programs during the last two years. Majors in course normally are required to take courses 50 and 51 in the junior year and are advised to take course 59 in the second semester of their senior year. Majors in honors are advised to take seminar 103 and either 101 or 102.

1-2. INTRODUCTION TO ECONOMICS. Messrs. Adams, Brown, Conard, Wilcox, and Mrs. Hunter. *Full Course*

This course is designed both to afford the general student a comprehensive survey of the field and to provide students doing further work in the department with a foundation upon which to build. It explains the organization and operation of free, planned, and mixed economies and analyzes the major problems involved in the allocation of resources, the distribution of income, the maintenance of industrial stability, and the provision of social security, and in international economic relationships.

3. ACCOUNTING. Mr. Cratsley. *Spring Semester*

Analysis of the problems of business organization and finance, banking, taxation and public regulation from the viewpoint of the principles and methods of corporate accountancy. It is the purpose of this course to equip the student with the rudiments of accounting that he will need to employ in his advanced courses and seminars in economics.

4. STATISTICS. Mrs. Hunter. *Fall Semester*

The purpose of this course is to make the student a knowledgeable and critical user of economic statistics. Topics covered include the analysis of frequency distributions, an introduction to sampling, problems of index number construction, and a survey of the more important methods used to analyze economic time series. This includes, in addition to the traditional ways of depicting seasonal variation, secular trend and the business cycle, a critical consideration of both econometrics and the methods of the National Bureau of Economic Research.

‡ Absent on leave, 1957-58.

11. ECONOMIC DEVELOPMENT. Mr. Wilcox. *Fall Semester*
 An analysis of the factors affecting economic growth: natural resources, labor, technology, capital formation, economic organization, cultural influences, and political and social institutions. An examination of the process of economic development, in the past, in Great Britain, in Western Europe, in the United States, in Japan, and in the Soviet Union. A study of the means of promoting the future economic development of underdeveloped countries. An appraisal of the prospects for continued economic growth in the United States. Open to sophomores.
12. INTRODUCTION TO INDIA AND PAKISTAN. Mr. Weatherford. *Spring Semester*
 A survey of the economic, political and social structure of modern India and Pakistan. The historical background of present problems and the possibilities of economic development. Open to sophomores.
50. ECONOMIC THEORY. Mr. Brown.
 The determination of prices in economic theory and in business practice. The distribution of income. Determinants of the level of income and employment. Not offered in 1957-58.
51. MONEY AND BANKING. Mrs. Hunter. *Spring Semester*
 The organization and operation of the commercial banking system in the United States. Central banking and the Federal Reserve system. Monetary policy and economic stability.
52. PUBLIC FINANCE. Mr. Brown. *Spring Semester*
 The revenues and expenditures of Federal, state, and local governments. The principles of taxation and borrowing. Budgetary control and debt management. Fiscal policy and economic stability.
53. BUSINESS ADMINISTRATION. Mr. Cratsley.
 The problems which confront the business executive. Internal organization and management. Marketing and merchandising. Risk, speculation, and insurance. Case studies of business policy. Not offered in 1957-58.
54. BUSINESS FINANCE. Mr. Brown. *Fall Semester*
 Corporate organization and finance. Investment banking and the securities markets. Financial policy and economic stability.
55. LABOR PROBLEMS. Mr. Weatherford. *Fall Semester*
 The structure and functions of labor unions. Employer approaches to labor relations. Analysis of wage policies. Governmental control of labor relations.
56. SOCIAL ECONOMICS. Mr. Weatherford.
 An examination of the extent, consequences, and causes of poverty, insecurity, and inequality. An appraisal of economic reforms; social insurance, medical care, housing, the social use of the taxing power, the "welfare state." Not offered in 1957-58.
- 57, 58. PUBLIC CONTROL OF BUSINESS. Mr. Wilcox. *Full Course*
Fall semester: competition and monopoly in American industry, enforcement and interpretation of the anti-trust laws, delivered pricing, the patent system, regulation of extractive industries and distributive trades.
Spring semester: regulation of municipal utilities, transportation, communications; American agricultural policy; control of prices in war-time; public ownership and operation of industry.

59. BUSINESS CYCLES. Mr. Brown. *Spring Semester*
Theories of business fluctuations. Applications of modern income theory to business cycles. Patterns of cyclical behavior and of long-term economic change. Implications for public policy. Prerequisite: Economics 51.
60. INTERNATIONAL ECONOMICS. Messrs. Conard and Wilcox. *Spring Semester*
The theory and practice of international trade. The balance of payments, foreign exchange, national commercial policies, international investment; relations between free and controlled economics.
61. URBAN SOCIAL PROBLEMS. Mr. Weatherford. *Spring Semester*
A study of some of the major social problems of the modern metropolis as seen in Philadelphia. Mental health, housing and city planning, industrial relations, criminology and local politics. Reading and class work are combined with six week-ends in Philadelphia studying these problems and the agencies which deal with them.

HONORS WORK

101. FINANCE AND FISCAL POLICY. Mr. Brown. *Spring Semester*
The principles of taxation. Revenues and expenditures of federal, state, and local governments. Corporation finance, investment banking. The securities and commodities exchanges, public regulation of financial practices. Problems of the federal debt. Fiscal policy and economic stability.
102. MONEY, CYCLES AND GROWTH. Mr. Pierson.
The monetary framework of capitalism. Theory and practice of commercial and central banking. Modern monetary and income theory as related to cyclical change. Nature of cyclical instability. Theory of economic growth in richer countries.
Not offered in 1957-58.
103. ECONOMIC THEORY. Mr. Conard. *Fall Semester*
Contemporary economic theory: price determination, the functional distribution of income, the level of employment. The function served by economic theory for Smith, Marx, and contemporary students. Criticism of theory in the light of empirical studies and simplifying assumptions.
104. PUBLIC CONTROL OF BUSINESS. Mr. Wilcox. *Fall Semester*
The anti-trust laws, the patent system, price discrimination, delivered price systems, resale price maintenance. The control of prices and production in agriculture, bituminous coal, petroleum and urban markets for fluid milk. Public regulation of municipal utilities, transportation and communications. Price control in war-time. The public ownership and operation of industry.
105. INTERNATIONAL ECONOMICS. Messrs. Conard and Wilcox. *Each Semester*
The theory of international trade. Monetary problems, cyclical fluctuations, and international monetary cooperation. Restrictionism and discrimination, cartels, commodity problems, shipping, aviation and telecommunications. Relations between free and controlled economies. Post-war reconstruction, economic development and international investment. International economic organization.
106. LABOR AND SOCIAL ECONOMICS. Mr. Weatherford. *Spring Semester*
Poverty, inequality, and insecurity. Labor legislation, organization, collective bargaining, wage-policy and the public control of labor relations. Public assistance, social insurance, medical care, housing, free income and the social use of the taxing power. Regional planning. The "welfare state."

THESIS

A thesis may be substituted for a course or a seminar under exceptional circumstances and by special arrangement.

Division of Engineering

SAMUEL T. CARPENTER, *Acting Chairman*

*(The staff members of the Division of Engineering
are listed under their respective departments)*

The engineering profession of today requires of its followers skill and resourcefulness as well as an integrated and thorough education in the natural and social sciences. The educational plan of the Division has been prepared with these requirements in mind. The objective of our program is to train the student professionally while providing the foundation of a liberal education. This is accomplished by educating the student in the professional disciplines of the engineer, such as critical analysis, humanistic studies, and the communication of ideas, as well as training in the techniques of the engineering sciences. Specifically, the three Engineering Departments intend that each student shall (1) master the fundamental concepts of Engineering; (2) extend this mastery in the field of Civil, Electrical or Mechanical Engineering with a view to later professional practice; (3) obtain a sufficient amount of general education to enable him to understand how his engineering activities fit into the great purposes of society.

A student who intends to major in Engineering * follows a common course of study for the first two years. This course adheres as far as possible to the general college program for freshmen and sophomores (see page 55), and prepares the student for his professional work of the junior and senior years. At the end of the sophomore year, the student may enter his major field of Civil, Electrical, or Mechanical Engineering. The last two years are largely spent in his major field. The three curricula of the Engineering Departments lead to the degree of Bachelor of Science; these curricula are accredited by the Engineers' Council for Professional Development.

Each curriculum provides that the student of Engineering will take about one-fifth of his work in the Divisions of the Humanities and Social Sciences, one-fourth of his work in the Departments of Chemistry, Mathematics, and Physics, and the remainder of his work in the three Departments of Engineering. All students devote their last two years: (1) to certain basic courses required of all engineers; (2) to fulfilling the major requirements of one of the departments of Engineering; (3) to developing their special interests. It is possible for students in any of the three departments whose interests lie also in the field of administration, physics, mathematics, chemistry, etc., to follow a special program integrating the two areas of study, as for example, Engineering and Physics or Engineering and Pre-medical studies.

The basic engineering program is outlined on the pages following. First is given the detail of the curriculum for the freshman and sophomore years. Modifications in this program may be made in individual cases, but it is essential that this body of work be completed before the junior year. Next follows a description of certain general courses in engineering open to all students. This is followed by an outline of the curriculum and a description of the courses offered by each major department.

* High school students intending to enter Engineering should take algebra, advanced algebra, plane and solid geometry, and trigonometry in secondary school.

OUTLINE OF THE BASIC ENGINEERING CURRICULUM FOR THE FIRST TWO YEARS

First Semester

English Literature
Chemistry
First Year Mathematics
Engineering Drawing
Surveying I
Social Science Elective

Second Semester

Freshman Year

English Composition
Chemistry
First Year Mathematics
Descriptive Geometry
Surveying II
Social Science Elective

Sophomore Year

Physics
Calculus
Statics
Materials & Shop Processes
Non-technical Elective

Physics
Calculus
Dynamics
Electric & Magnetic Circuits
Non-technical Elective

GENERAL COURSES

- GE1. ENGINEERING DRAWING. Mr. Morrill and Mr. Prager. *Fall Semester*
Instruction in the use of drafting equipment; study of fundamental principles of engineering drawing; practice through rendering of detailed elements and machine assemblies; lettering and sketching. Required for freshman engineers. Open to all students.
Two three-hour periods per week.
- GE2. DESCRIPTIVE GEOMETRY. Mr. Morrill and Mr. Prager. *Spring Semester*
An extension of the basic conception of orthographic projection as applied to the location and definition in space of three-dimensional structures; analysis of the geometric relation of distances, angles, intersections of lines and planes; development of surfaces; emphasis upon practical applications of descriptive geometry in the various fields of engineering. Required for freshman engineers. Open to all students who have had GE1 or equivalent.
Three three-hour periods per week.
- GE11. MATERIALS AND SHOP PROCESSES. Staff. *Fall Semester*
Study of elementary metallurgy of ferrous and non-ferrous materials; investigation in the laboratory of various engineering materials as they are affected by stress, temperature, and heat treatment; analysis of purposes and practice in use of machine tools with emphasis on their performance with the variety of materials used in manufacturing processes.
Three class periods per week; two three-hour laboratories each week.
- GE51. INDUSTRIAL MANAGEMENT. Mr. Cope. *Spring Semester*
Study of organization and management of industrial enterprises; historical background and evolution of present-day scientific practices; significance of arrangement of physical plant, production control, financial policies, wage payment, and personnel relations. Open to all juniors and seniors.
Three class periods per week; one three-hour laboratory each week.
- GE57. ENGINEERING ECONOMY. Mr. Carpenter. *Spring Semester*
A study of the methods of determining the relative economy of engineering alternatives; compound interest and the calculation of annual cost, present worth and prospective rates of return. A method of analysis which the engineer uses when he investigates a proposed course of action to decide whether it will prove to be economical. Open to all juniors and seniors.
Three class periods per week; one three-hour laboratory each week.

Civil Engineering

PROFESSOR: SAMUEL T. CARPENTER, *Chairman*

ASSISTANT PROFESSORS: ROY F. LINSSENMEYER†
CHARLES W. NEWLIN
M. JOSEPH WILLIS

INSTRUCTOR: ROBERT J. STONE

The work of the Civil Engineer involves design, research, management, and construction, in the following fields: buildings, bridges, aircraft, soils and foundations, hydraulics and hydroelectric power, city and regional planning, sanitation and public health, highways, airports, railways, and other projects of a public or private nature, with their economic justification. The basic curriculum also provides a foundation for those interested in aeronautical structures, architectural engineering, naval architecture, and engineering mechanics.

Emphasis is placed on the broad scientific and humanistic education required for an understanding of fundamental principles, based on the conviction that those possessing such a background will contribute most to the future progress of the profession.

Students may elect to enter the Civil Engineering honors program at the beginning of the junior year, although the establishment of an honors seminar depends upon the number of students who wish to enroll. Excellent facilities and opportunities are available to students who may wish to do research as part of their educational program.

STANDARD PROGRAM FOR COURSE STUDENTS

<i>Fall Semester</i>	<i>Junior Year</i>	<i>Spring Semester</i>
CE51 Mechanics of Materials	CE52 Structural Theory	
EE51 Electrical Apparatus	CE54 Soil Mechanics and Foundations	
ME51 Thermodynamics I	ME54 Fluid Mechanics	
Math 51 Advanced Calculus	Elective	
	<i>Senior Year</i>	
CE53 Adv. Structural Theory	CE58 Special Topics	
CE55 Civil Engineering Design I	CE56 Civil Engineering Design II	
CE57 Sanitary Engineering	GE57 Engineering Economy	
CE69 Thesis (or Elective)	Elective	
CE1 SURVEYING, I. Mr. Willis, Mr. Stone.		<i>Fall Semester</i>
A study of the basic procedures used in making surveys for engineering work, including the use, care, and adjustment of instruments, note keeping, linear and angular measurements, leveling, traversing, stadia surveys, topographic mapping, calculation of areas, and drafting room methods. Open to all students who have had trigonometry in high school or college. (1 recitation and 1 3-hour laboratory per week.)		
CE2 SURVEYING, II. Mr. Willis, Mr. Stone.		<i>Spring Semester</i>
A continuation of CE1, covering celestial observations, preparation of profiles and maps from field notes, elements of photogrammetry, highway curves and earthwork, plane table surveys, and land surveying.		
Prerequisite: CE1. (1 recitation and 1 3-hour laboratory per week.)		

† Absent on leave, 1957-58.

CE11 STATICS. Mr. Carpenter, Mr. Stone. *Fall Semester*

Concept and definition of force, scalar, and vector quantities; combination and resolution of forces; principle of moments and couples; graphical and analytical conditions for equilibrium; stress diagrams, cables; centroids of areas, volumes, and masses; area and volume theorems. Open to students who have taken Mathematics 3-4. (3 recitations and 1 3-hour laboratory per week.)

CE12 DYNAMICS. Mr. Willis, Mr. Stone. *Spring Semester*

Principles of dynamics, motion of a particle, Newton's laws, general equation of motion, rectilinear motion, displacement, velocity, speed, and acceleration; simple harmonic motion, free and forced vibration; inertia forces, work and energy, momentum and impulse; curvilinear motion; kinetic energy of rotation; balancing of rotating bodies; relative motion, angular momentum; combined translation and rotation.

Prerequisite: CE11 and Mathematics 11. (3 recitations and 1 3-hour laboratory per week.)

CE51 MECHANICS OF MATERIALS. Mr. Stone. *Fall Semester*

This course deals with the internal stresses and changes of form which always occur when forces act upon solid bodies. The mechanics involved in the design of simple engineering structures is presented so that the student may realize the problems which must be solved in order to secure the required strength and stiffness in such structures. The laboratory work of this course is planned to clarify the theoretical considerations of beams, columns, combined stress, torsion and methods of strain measurement.

Prerequisite: CE11, Statics, and Mathematics 12. (3 recitations and 1 3-hour laboratory per week.)

CE52 STRUCTURAL THEORY. Mr. Carpenter. *Spring Semester*

Analysis of determinate and indeterminate structures. A study of stresses in truss and rigid frame systems, influence lines.

Prerequisite: CE51 Mechanics of Materials. (3 recitations and 1 3-hour laboratory per week.)

CE53 ADVANCED STRUCTURAL THEORY. Mr. Carpenter. *Fall Semester*

A study of indeterminate structural systems and advanced structural theory. Structural models.

Prerequisite: CE52 Structural Theory. (3 recitations and 1 3-hour laboratory per week.)

CE54 SOIL MECHANICS AND FOUNDATIONS. Mr. Newlin *Spring Semester*

The principles of soil mechanics as related to the structural stability of soils under internal and external force systems. Foundations for buildings, bridges, highways, and airports are extensively treated. Research in soil mechanics. (3 recitations and 1 3-hour laboratory per week.)

CE55 CIVIL ENGINEERING DESIGN—I. Mr. Carpenter, Mr. Newlin *Fall Semester*

An introduction to the design of structures. Fundamental stress analysis, considerations of structural members and connections for metallic, concrete, and timber structures, including buildings, bridges, and aircraft.

Prerequisite: CE52 Structural Theory or equivalent. (2 recitations and 2 3-hour laboratories per week.)

CE56 CIVIL ENGINEERING DESIGN—II. Mr. Carpenter, Mr. Newlin. *Spring Semester*

A continuation of Civil Engineering Design I. Planning, analysis, and design of engineering structures and foundations. Additional topics in concrete with ordinary and pre-stressed reinforcement. Ultimate design theory.

Prerequisite: CE55 Civil Engineering Design—I. (2 recitations and 2 3-hour laboratories each week.)

CE57 SANITARY ENGINEERING. Mr. Willis. *Fall Semester*

The activities of the sanitary engineer, including the development and purification of water supplies; sewerage and sewage disposal. Also relates sanitary engineering to the broad field of public health, and includes subjects dealing with hydrology and advanced hydraulics.

Prerequisite: ME54 Fluid Mechanics. (3 recitations and 1 3-hour laboratory per week.)

CE58 SPECIAL TOPICS. Staff.

Required course with subject matter dependent on a group need or interest. Past groups have studied advanced soil mechanics, theory of elasticity, transportation, advanced hydraulics, or structural mechanics.

CE69 CIVIL ENGINEERING THESIS. Staff.

The time allotted to a civil engineering thesis is generally one semester. The subject matter of the thesis must be approved by the department chairman six weeks before the beginning of the semester. Excellent facilities exist for independent investigations in structures, soils, and materials.

Electrical Engineering

PROFESSORS: HOWARD M. JENKINS, *Chairman*
JOHN D. MCCRUMM‡

ASSISTANT PROFESSORS: CARL BARUS
DAVID L. BOWLER

Electrical Engineering deals largely with the development and application of precise notions of electricity and its allied physical sciences in the broad field of the conversion, transmission, control, and utilization of electrical energy for the purposes of transmitting power and communicating intelligence. The program in Electrical Engineering gives full recognition to the natural sciences basic to the profession, and includes considerable work in the Humanities and Social Sciences, since the needs of the profession are best served by engineers who are vitally aware of the society in which they work.

The educational objectives of the Department are to provide the student with a thorough understanding of the fundamental principles of the natural sciences related to Electrical Engineering, and to inculcate in the student the confidence to apply these principles to new situations. Considerable emphasis is placed on the experimental evidence underlying these fundamentals, and mathematical methods are used to facilitate the application of these principles. Since most engineering problems can be solved only by making certain simplifications, the student is encouraged to examine problems critically and to make such simplifying assumptions as are possible without destroying the significance of the results. The importance of the presentation of work is also stressed, the student being required to gain some proficiency in communicating the results of his work clearly, completely, and in a well organized form.

The courses in Electrical Engineering are such a series of inquiries dealing with fundamental concepts of electrical phenomena. The common aim is to carry the student to such a point that he will understand the basic sciences involved and can apply this knowledge to the problems of his later professional practice.

Unless specifically modified, the requirements for course students are listed below; it is expected that majors will maintain a "C" average or better in the required electrical courses.

STANDARD PROGRAM FOR COURSE STUDENTS

First Semester

EE53 A. C. Circuit Theory
EE55 Engineering Analysis I
CE51 Mechanics of Materials
ME51 Thermodynamics I

Junior Year

EE57 Electrical Machinery I
EE59 Electronics I
EE61 Field Theory
Elective

Senior Year

EE54 Network Theory
EE56 Engineering Analysis II
ME54 Fluid Mechanics
Elective

EE58 Electrical Machinery II
EE60 Electronics II
Technical Elective
Elective

‡ Absent on leave, 1957-58.

EE12 ELECTRIC AND MAGNETIC CIRCUITS.

Spring Semester

The experimental basis of electricity and magnetism; elementary electrostatics and magnetostatics; voltage, current power, energy. Bilateral and linear networks with constant driving voltages. Induced electromotive forces; capacitance and inductance; elementary problems in ferro-magnetism.

Three class periods per week; one laboratory each week.

Prerequisites: Physics 1 and to be preceded or accompanied by Integral Calculus

EE51 ELECTRICAL APPARATUS.

Fall Semester

Theory of direct-current generators and motors; fundamentals of control for direct current machines. Topics include flux, generated voltage, armature reaction, commutation, torque, speed, voltage and speed regulation, losses, efficiency, and effects of control on motor characteristics. Relations of simple harmonic electromotive forces and currents, power, power factor; single phase circuits; polyphase circuits, balanced and unbalanced. The construction, characteristics, and operation of alternators, induction motors, transformers, synchronous motors.

Three class periods per week; one laboratory each week.

Prerequisite: EE12 Electric and Magnetic Circuits.

EE52 INSTRUMENTATION AND CONTROL.

Spring Semester

A study of the fundamentals of electronics and electronic circuits, control and regulation devices, particularly those involved in measuring systems and in servo-mechanisms; designed primarily for engineering majors.

Three class periods per week; one laboratory each week.

Prerequisite: EE51 Electrical Apparatus.

EE53 ALTERNATING CURRENT CIRCUIT THEORY.

Fall Semester

A systematic study of single and polyphase electric circuits under steady state conditions.

Three class periods per week; one laboratory each week.

Prerequisite: EE12 Electric and Magnetic Circuits.

EE54 NETWORK THEORY.

Spring Semester

General network analysis; network theorems; four-terminal networks; filters; introduction to network synthesis; transmission lines.

Three class periods per week; one laboratory each week.

Prerequisites: EE53 A.C. Circuit Theory, and EE55 Engineering Analysis I, or equivalents.

EE55 ENGINEERING ANALYSIS I.

Fall Semester

Formulation and application of the method of engineering analysis based upon fundamental physical laws, mathematics, and practical engineering considerations. Emphasis is placed on the professional approach to the analysis of new, bona fide engineering problems. A study is made of the common physical and mathematical aspects shared by different systems such as mechanical, thermal, electrical and acoustical. The theory and application of ordinary differential equations is systematically covered.

Three class periods per week; one laboratory each week.

Prerequisites: EE12 Electric and Magnetic Circuits, and Integral Calculus.

EE56 ENGINEERING ANALYSIS II.

Spring Semester

Further analysis of physical systems, employing the following branches of mathematics: Gamma and Bessel functions, Fourier series and other infinite series, partial differential equations, and boundary value problems, conformal mapping, dimensional analysis, the Laplace transform.

Three class periods per week.

Prerequisite: EE55 Engineering Analysis I.

EE57 ELECTRICAL MACHINERY I.

Fall Semester

Physical aspects of electromechanical energy conversions; conversions and principles of such conversions; basic concepts of machine performance and the analysis of rotating electrical machinery and transformers; D-C machines, analysis of performance and applications.

Three class periods per week; one laboratory each week.

Prerequisite: EE53 A.C. Circuit Theory.

EE58 ELECTRICAL MACHINERY II.

Spring Semester

Synchronous machines, performance, effects of saturation and saliency; poly-phase induction machines; fractional horsepower motors; rotating control devices; self-synchronous machines; electrical transients and the dynamics of coupled systems.

Three class periods per week; one laboratory each week.

Prerequisite: EE57 Electrical Machinery I.

EE59 ELECTRONICS I.

Fall Semester

A study of the physical principles and circuit behavior of electronic devices, including vacuum tubes, semiconductor devices, gas tubes, photoelectric devices, etc.

Three class periods per week; one laboratory each week.

Prerequisite: EE53 A.C. Circuit Theory, or equivalent.

EE60 ELECTRONICS II.

Spring Semester

Further study of the analysis and design of electronic circuits.

Three class periods per week; one laboratory each week.

Prerequisite: EE59 Electronics I.

EE61 FIELD THEORY.

Fall Semester

An analytical study of static electric and magnetic fields, time-varying electromagnetic fields, wave propagation and reflection, wave guides, antennas.

Three class periods per week; one laboratory each week.

Prerequisites: EE53 A.C. Circuit Theory, and EE56 Engineering Analysis II, or equivalents.

EE63 ELECTRICAL INSTRUMENTATION.

Fall Semester

Designed primarily for students in chemistry, biology, psychology, and other non-engineering fields who may have occasion to use electrical techniques in their work. Subject matter includes an introduction to the fundamental concepts of electricity, electric circuit analysis, electrical measurements, electronic devices and their application in measurement and control circuits.

Three class periods per week; one laboratory each week.

Prerequisite: Physics 1-2.

Not offered in 1957-58.

EE64 SERVOMECHANISMS.

Spring Semester

An introduction to automatic control systems using Laplace transform techniques. System design is studied by means of the Nyquist diagram and the commonly used frequency response methods. Other topics include compensation networks, multiple input systems, Nichols charts, etc.

Three class periods per week; one laboratory each week.

EE65 ADVANCED ELECTRONICS.

Fall Semester

Problems relating to electronic information-processing systems. Such topics are considered as introductory communication theory, modulation systems, noise, digital devices and circuits, analog circuits, logical design of switching networks.

Three class periods per week; one laboratory each week.

Prerequisite: EE60 Electronics II.

EE71 ELECTRICAL ENGINEERING THESIS. Staff.

An engineering thesis may be substituted for a course or for the examination on the subject matter covered in a seminar, by special arrangement with the staff

HONORS

The four following seminars are offered by the Department to prepare in part for examinations for a degree with Honors. Students who plan to take honors seminars in Electrical Engineering should note that Circuit Theory is a desirable preparation for Electronics (although not a prerequisite if a Seminar in Electricity and Magnetism has been taken). Adequate training in electrical machinery, and the Circuit Theory seminar or its equivalent, are prerequisites for the seminar in Servomechanisms. Some knowledge of A.C. Circuit Theory is a prerequisite for the Machinery Seminar.

101. CIRCUIT THEORY.

Transient and steady-state analysis of electrical networks. Mathematical tools such as complex algebra, matrix algebra, and the Laplace transformation are used in the study of single and polyphase circuits, network theorems, the general four-terminal network, electric filters, and transmission lines. An introduction to network synthesis from pole and zero locations in the complex plane is included. The seminar is accompanied by a full-day laboratory.

Not offered in 1957-58.

102. ELECTRONICS.

A study of electronic devices and circuits. Subject matter includes physical theory of electron tubes, semiconductor devices, and other electronic circuit elements; design of electronic circuits applicable to communications, instrumentation, information processing systems, etc.; transient and steady-state analysis of electronic circuits and systems; introductory topics in the theory of communication and information; microwave tubes. The seminar is accompanied by a full-day laboratory.

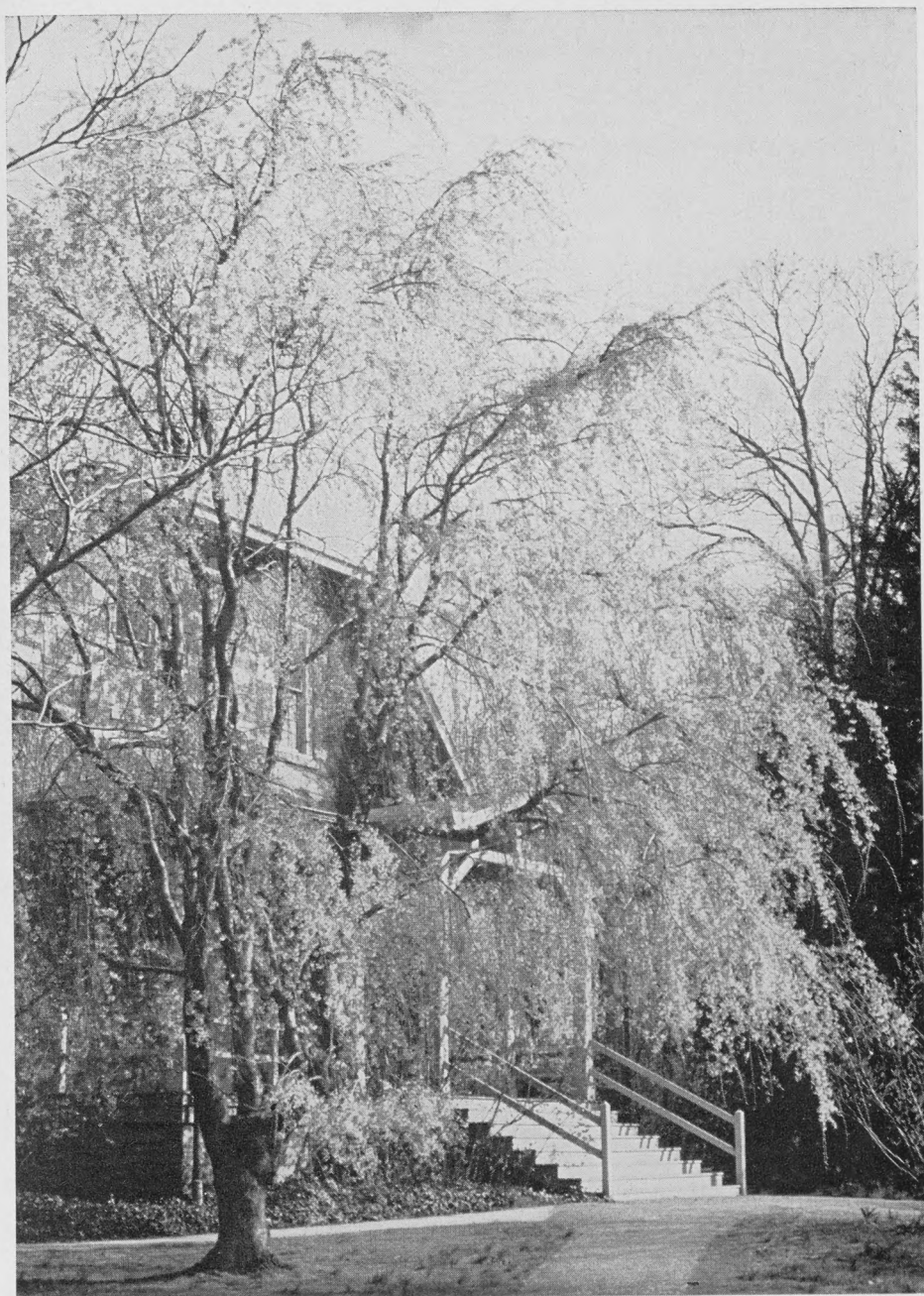
103. SERVOMECHANISMS.

A systematic investigation of the characteristics of closed cycle control systems and their components. The mechanisms may be any combination of electrical, thermal, mechanical or hydraulic systems. Synthesis rather than analysis is stressed thus requiring use of the more powerful methods of the Laplace transform, and a study of transfer function loci and equations in the complex domain. Modern techniques are employed; extensive reading in the literature is expected of each student. There is one full-day laboratory per week, in addition to the seminar.

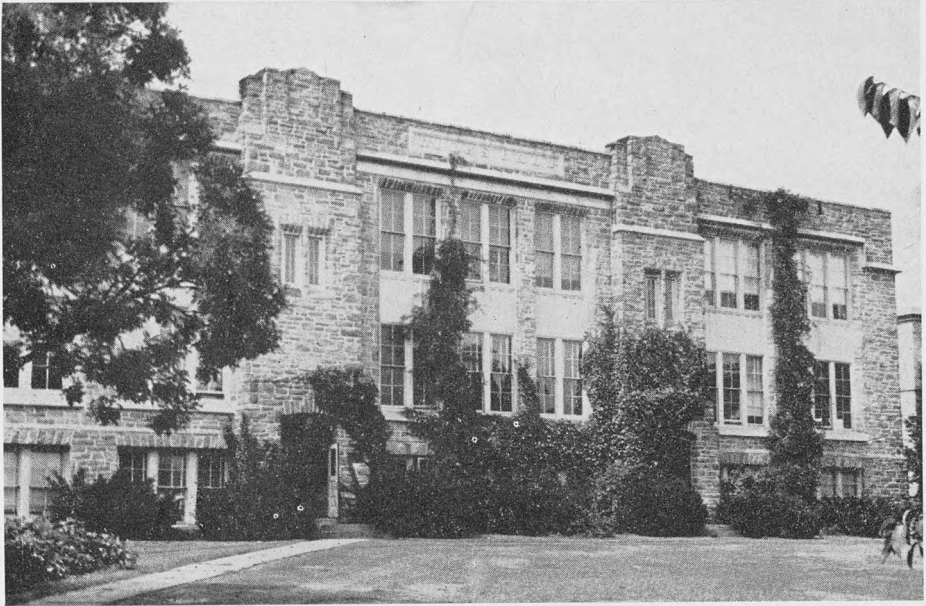
104. MACHINERY.

An intensive study of the basic aspects shared in common by transformers and rotating electrical machinery. A further study of the operating characteristics and the engineering application of electrical machines as specific direct current and alternating current devices. There is one full-day laboratory per week, in addition to the seminar.

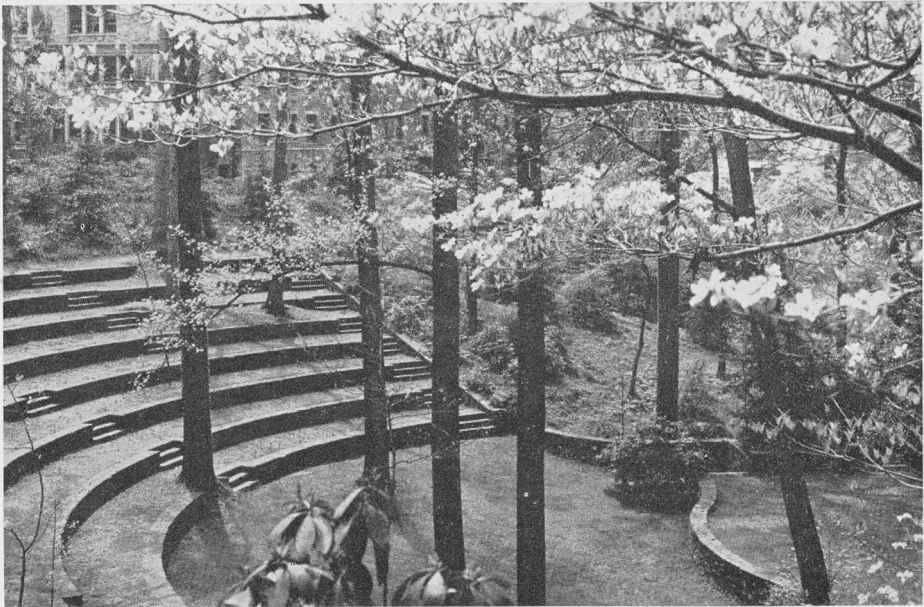
Not offered in 1957-58.



Friends Meeting House



Hicks Hall, An Engineering Building



Arthur Hoyt Scott Auditorium

Mechanical Engineering

PROFESSOR: WILLIAM J. COPE, *Chairman*

ASSOCIATE PROFESSOR: BERNARD MORRILL

ASSISTANT PROFESSOR: PHILIP C. PRAGER

INSTRUCTOR: TOSHIYUKI FUKUSHIMA

The curriculum in Mechanical Engineering is planned to develop the student through scientific training for positions in manufacturing industries, with organizations engaged in power production, and in the field of transportation. Based upon the fundamental sciences of physics, chemistry, and mathematics, the program aims to provide a background for the solution of the variety of problems related to the design, construction and operation of engineering equipment used in industrial establishments. The arrangement of courses is intended also to prepare mechanical engineers for such activities as those which deal with fabrication of products and the eventual assumption of managerial responsibilities, as well as research and development work leading to new products.

Coincident with the need for a broad and fundamental technical training, all of the engineering profession should be conscious of the impact upon society resulting from their efforts. To stimulate this awareness, students are encouraged to choose electives in the Humanities and Social Sciences throughout their undergraduate careers.

STANDARD PROGRAM FOR COURSE STUDENTS

<i>Fall Semester</i>	<i>Junior Year</i>	<i>Spring Semester</i>
CE51 Mechanics of Materials	EE52 Instrumentation and Control	
EE51 Electrical Apparatus	ME52 Thermodynamics II	
ME51 Thermodynamics I	ME54 Fluid Mechanics	
EE55 Engineering Analysis	Elective	
	<i>Senior Year</i>	
ME53 Thermodynamics III	ME62 Adv. Strength of Materials	
ME55 Adv. Fluid Mechanics	ME64 Engineering Design	
ME63 Kinematics and Design	GE51 Industrial Management	
Elective	Elective	

ME51 THERMODYNAMICS I. Mr. Cope.

Energy and first law of thermodynamics; application of general energy equation to steady-flow and non-flow processes; properties of liquids; vapors, gases, mixtures; reversible cycles; second law of thermodynamics; entropy.

Three class periods per week; one three-hour laboratory each week.

Prerequisite: Integral Calculus.

ME52 THERMODYNAMICS II. Mr. Cope.

Extension of ME51; application of thermodynamic principles to problems in air conditioning, combustion, steam generation and refrigeration. Analysis of modern steam power plant cycles, expansion of steam in nozzles and turbines, energy balance calculations. Introduction to the principles of heat transfer.

Three class periods per week; one three-hour laboratory each week.

Prerequisite: ME51.

ME53 THERMODYNAMICS III. Mr. Prager.

Extension of ME51 and ME52; analysis of gas cycles basic to internal combustion engine practice; behavior of real gases and mixtures; general thermodynamic equations; combustion of liquid and gaseous fuels; gas compression. Study of application of fundamental principles as demonstrated in design, test and operation of spark-ignition and compression-ignition engines, gas turbines and compressors. Three class periods per week, one three-hour laboratory each week.
Prerequisites: ME51 and ME52.

ME54 FLUID MECHANICS. Mr. Prager.

An introductory course in fluid statics; kinematics; equation of continuity; steady flow energy and momentum; dynamics of an ideal fluid; dimensional analysis and similitude; incompressible flow in closed conduits and compressibility phenomena. Three class periods per week; one three-hour laboratory each week.
Prerequisites: Integral Calculus, ME51 Thermodynamics.

ME55 ADVANCED FLUID MECHANICS. Mr. Fukushima.

Extension of ME54. Theory of fluid mechanics in turbomachinery and jets; fluid dynamics leading to Navier-Stokes equation, Euler's equation, potential theory; one dimensional compressible flow.
Three class periods per week; one three-hour laboratory each week.
Prerequisite: ME54 Fluid Mechanics.

ME62 ADVANCED STRENGTH OF MATERIALS. Mr. Fukushima.

Review of stress and strain; torsion; bending; beams on elastic foundations; thick cylinders; failure of metals under stress; plastic flow; influence of stress concentration and working stresses.
Three class periods per week; one three-hour laboratory each week.
Prerequisite: EE55 Engineering Analysis.

ME63 KINEMATICS AND DESIGN. Mr. Morrill.

A study of the complex motions and velocities of machine linkwork and gearing; design of cams, screws, fastenings, belts, straight and curved frames, gears and shafting.
Three class periods per week; one three-hour laboratory each week.
Prerequisite: EE55 Engineering Analysis, CE51 Mechanics of Materials.

ME64 ENGINEERING DESIGN. Mr. Morrill.

Extension of ME63; lubrication and bearing design; design of machine assemblies. Vibration analysis; including dynamics of a particle, single and several degrees of freedom, beams and shafts, Lagrange equations, vibrations in elastic media.
Three class periods per week; one three-hour laboratory each week.
Prerequisite: ME63 Kinematics and Design.

ME71 MECHANICAL ENGINEERING THESIS. Staff.

With departmental approval, an undergraduate may undertake a thesis project as a portion of the program in the senior year.

HONORS

The following five seminars are offered by the Department of Mechanical Engineering as part of the students' preparation for examinations for a degree with Honors. Students who plan to take Honors seminars should note that Engineering Analysis is a desirable preparation for the seminars in Strength of Materials, Design, and Fluid Mechanics, and that the seminar in Thermodynamics is also a prerequisite for that in Fluid Mechanics.

ME101 THERMODYNAMICS.

A study of energy and the laws of thermodynamics with emphasis on the broader aspects of the subject and with applications to a wide variety of systems. The properties of liquids, vapors, gases and mixtures. Reversible cycles. Analysis of actual cycles and engineering machines. Introduction to the principles of heat transfer. The seminar is accompanied by a full day laboratory each week.

ME102 STRENGTH OF MATERIALS.

A comprehensive study at both elementary and advanced levels of stress and strain in bending, shear and torsion. Elastic deformation; failure under stress, stress concentration, working stress and limit design. The seminar is accompanied by a full day laboratory each week.

ME103 MECHANICAL ENGINEERING DESIGN.

Motion, velocity and acceleration in linkwork and gearing. Design of cams, fastenings, gears, shafting and frames. Design of elements under rotational stress. Vibration analysis. Fundamentals of lubrication. Design of machine assemblies. The seminar is accompanied by a full day laboratory each week.

ME104 FLUID MECHANICS.

Compressible and incompressible subsonic and supersonic fluid flow. Energy and momentum. Dimensional analysis and similitude. Dynamics of an ideal fluid. Shock phenomena. Theory of fluid mechanics in turbomachinery and jets. The seminar is accompanied by a full day laboratory each week.

ME106 THESIS.

An individual thesis project involving some original investigation, analysis, or experimentation and a report. The exact program to be adjusted to individual needs.

English Literature

PROFESSORS: GEORGE J. BECKER, *Chairman*

EVERETT L. HUNT

ELIZABETH COX WRIGHT‡

ASSOCIATE PROFESSOR: FREDRIC KLEES

ASSISTANT PROFESSORS: DAVID COWDEN

DANIEL G. HOFFMAN

SAMUEL L. HYNES

INSTRUCTORS: JOHN S. COLLIDGE

ALEX ZWERDLING

LECTURER: BARBARA PEARSON LANGE

This department might more properly be called the Department of Literature in English, since it offers a study both of literature originally written in the English language and of works translated from other tongues. Literature is considered as a fine art, as a cultural record, and as a guide to the student's interpretation of his own experience in life. The program of courses and seminars comprises four approaches to the subject: the intensive study of the work of major writers, examination of the literature produced in certain limited periods, the historical development of the major literary types, and the grouping of various types or forms on the basis of their subject matter or point of view. The general purposes of this study are the broadening of the student's understanding and enjoyment of literature, the development of a basis for intelligent criticism, and the provision of a foundation for further study in the field. Stress is also laid upon accurate reading and writing through critical explication of texts and criticism of student papers.

REQUIREMENTS FOR MAJORS IN COURSE

The work of the major in this department in course normally consists of at least four full courses in the department, including Modern Literature in the first year, either Chaucer or Milton in the second year, a full course or two half courses in one of the types (numbers 21-26 below) in the third year, and Shakespeare and the Senior Conference in the final year. The comprehensive examination at the close of the senior year is based on this work, but also includes questions on other courses offered by the department for those prepared in these fields. A reading list in English and American literature is given to all majors to act as a guide in the selection of courses and to independent reading in preparation for the Senior Conference. Majors are expected to take a semester's work in either Fine Arts or Music and are advised to take a semester's work in some foreign literature. Students expecting to do graduate work should acquire a reading knowledge in the languages required by the schools they propose to attend.

‡ Absent on leave, 1957-58.

COURSES

1. MODERN LITERATURE: Introduction to Literary Study. Staff. *Each Semester*
An introduction to the critical study of the four principal types of literature: poetry, drama, novel, and non-fictional prose. The materials are drawn chiefly from modern American literature for the purpose of emphasizing the relationship of literature to life through the study of works produced from backgrounds familiar to the student in terms of his own experience.
Prerequisite to all other literature courses offered by the department.
2. PERIOD STUDIES IN ENGLISH LITERATURE. Staff. *Spring Semester*
Application of the methods learned in course 1 to older materials. The period studied will vary from year to year.
5. COMPOSITION. Mr. Coolidge and Mr. Zwerdling. *Each Semester*
Training in the writing of non-fictional prose. Designed to meet the requirements of Engineering and Pre-Medical students. Other students admitted on the basis of need for this work.
6. ARGUMENT. Mr. Coolidge *Spring Semester*
The analysis and orderly presentation of large bodies of material in speech and writing. The work comprises a series of short analytical papers, a research paper of some magnitude, and a series of argumentative speeches. Admission only with consent of the instructor.
11. MILTON AND THE 17TH CENTURY. Mr. Hunt and Mr. Coolidge. *Each Semester*
Paradise Lost, selections from Milton's shorter poems, *The Old Testament*, Bunyan's *Pilgrim's Progress*, and the lyrics of John Donne are read. Study is made of narrative, epic, and lyric writing, and the relationship of the literature to the thought of the period.
12. CHAUCER. Mr. Klees. *Fall Semester*
Reading of *Troilus and Criseyde*, *The Canterbury Tales* and some of the minor poems in the original Middle English, with greater attention to the literary than to the linguistic aspects.
17. SOCIAL CRITICISM. Mr. Becker.
The reactions of such major figures as Carlyle, Mill, Henry Adams, Bellamy and Morris to the changed conditions of life after the Industrial Revolution. An attempt is made both to analyze the social comment or protest in individual works and to explore the part that social forces play in modern literature.
Not offered in 1957-58.
- 21, 22. ENGLISH POETRY. Mrs. Wright and Mr. Hoffman.
A survey of English poetry from its beginnings, with a study of the principles of poetic criticism and a detailed examination of the work of two or three poets. For upperclassmen or second-semester sophomores by permission.
- 23, 24. THE ENGLISH NOVEL. Mr. Cowden.
The first semester covers the development of the English novel from Fielding to Trollope with emphasis on the chronicle form prevalent during this period. In contrast, the second semester emphasizes developments in technique and content from Meredith to the present day. Credit given for either semester, but students desiring both should take them in the regular sequence.
25. COMEDY. Mr. Klees. *Fall Semester*
Dramatic comedy in its various forms, English and American, with particular attention to the Elizabethan, Restoration, and modern periods.

26. TRAGEDY. Mr. Klees. *Spring Semester*
 Dramatic tragedy from the *Agamemnon* trilogy to *Death of a Salesman*, with emphasis on Elizabethan and modern American tragedy.
- 31, 32. LITERATURE IN AMERICA. Mr. Hoffman.
 A study of the major American writers from Puritan times to the early 20th century.
 For upperclassmen. Either semester may be taken independently.
34. ROMANTICISM. Mr. Becker. *Spring Semester*
 The general modification of European sensibility as reflected in the literature of the late eighteenth and early nineteenth centuries.
35. REALISM. Mr. Becker. *Fall Semester*
 A study of realism as a literary movement. Beginning with *Madame Bovary*, the course traces the development of realistic techniques and concepts in Zola, in the Russians, and in American writers such as Norris and Dreiser.
42. SHAKESPEARE. Mr. Klees, Mr. Hynes, and Mr. Zwerdling. *Each Semester*
 A study of the major plays. Not open to majors in this department.
43. MODERN POETS. Mr. Hynes. *Spring Semester*
 An intensive study of a few major modern poets, with emphasis on problems of interpretation.
 Open only to upperclassmen.
44. HARDY, CONRAD, AND JOYCE. Mr. Cowden. *Spring Semester*
 An intensive study of these three novelists.
 Offered as an alternative to course 24 to upperclassmen who have had course 23.
- 51-52. SHAKESPEARE. Staff. *Fall Semester*
 A study of the complete works of Shakespeare, tracing the development of his craftsmanship and ideas. Required of majors in this department, who meet weekly in small groups during the first semester of the senior year.
- 53-54. SENIOR CONFERENCE. Staff. *Spring Semester*
 Group meetings of departmental majors held in the second semester of the senior year for the purpose of reviewing, integrating, and supplementing the student's course program.
- GREEK LITERATURE IN TRANSLATION (Greek 36).
- LATIN LITERATURE IN TRANSLATION (Latin 37).

WRITING AND SPEAKING

Students in need of training in Composition may be required to take tutorial work or to complete Course 5 before entering the junior year.

Instruction in Public Speaking is given weekly, by Mrs. Lange, in a non-credit course. Students are asked to prepare and deliver formal and informal speeches, introductions, presentations, and to take part in roundtable discussions. Frequent recordings of each student are made to aid in self-criticism.

Extra-curricular student groups for practice in creative writing, acting, and debating meet with members of the departmental faculty.

HONORS WORK

Prerequisites: The course requirements for a major in Honors are the same as for a major in course, Modern Literature and either Chaucer or Milton. The election of an additional course in the sophomore year is advised when the schedule permits it, and The History of England is also recommended.

For admission with a minor in this department, the requirement is one year of work, including Modern Literature.

Program: Majors in Honors must take four seminars in the department, including Shakespeare and one of the types seminars from Group II. Minors in Honors may enroll in any two or three of the seminars offered as may seem best suited to the purposes of their whole program.

Seminars: The following seminars prepare for examinations for a degree with Honors.

Group I

101. SHAKESPEARE. Mr. Becker, Mr. Cowden, and Mr. Hynes. *Each Semester*
Each Semester
A study of the mind and art of Shakespeare as dramatist and poet. The emphasis is on the major plays, with a more rapid reading of the remainder of his work. Students are advised to read through all of the plays before entering the seminar.
102. MILTON AND THE 17TH CENTURY. Mr. Hunt. *Fall Semester*
Milton, Donne, and the poetry of the Bible.
103. CHAUCER. Mr. Klees. *Fall Semester*
A study of Chaucer's poetry and age.

Group II

104. VICTORIAN POETRY. Mrs. Wright. *Spring Semester*
The basic elements of poetic expression, thought, imagery, and sound are studied separately, and then brought together in the examination of four long poems.
Not offered in 1957-58.
105. CONTEMPORARY POETRY. Mr. Hynes. *Spring Semester*
A study of the modern tradition in English and American poetry from Yeats to the present. The seminar will concentrate on the work of a few major poets, and will emphasize the development of techniques of analysis and interpretation.
106. DRAMA. Mr. Klees. *Spring Semester*
A study of comedy and tragedy in the Greek, Elizabethan, and modern periods with a consideration of the various forms these types take from one age to another.

107. NOVEL. Mrs. Wright and Mr. Cowden. *Each Semester*
 Chiefly late 19th century. Principles of aesthetics applied to the novel form are developed from the study of selected novels outside the Victorian tradition.
109. RENAISSANCE POETRY. Mrs. Wright. *Spring Semester*
 The method of the seminar is the same as that of the Victorian Poetry seminar, which is given in alternate years. The poems studied are chosen from the Spenserian and Metaphysical strains, chiefly of the early seventeenth century.
 Not offered in 1957-58.

Group III

110. MODERN COMPARATIVE LITERATURE. Mr. Becker. *Fall Semester*
 Using the realistic movement as a starting point, this seminar considers some of the major themes and philosophic attitudes embodied in recent literature. The chief figures studied are Flaubert and Zola, Tolstoy and Dostoevsky, Kafka and Mann, Joyce and Faulkner.
112. SATIRE. Mr. Coolidge. *Fall Semester*
 A study of major satirical literature, with particular attention to philosophical metaphor and the ironic mode.
 Not offered in 1957-58.
114. ROMANTICISM. Mr. Zwerdling. *Fall Semester*
 The philosophic strain of romanticism as it moves from Continental writers through such English figures as Wordsworth, Coleridge and Carlyle, and such Americans as Emerson, Melville, and Whitman.
 Not offered in 1957-58.
115. PROBLEMS IN AMERICAN LITERATURE. Mr. Hoffman. *Spring Semester*
 An exploration of the relations between democracy and literature, with a study of the forms, subjects, and aesthetic premises of selected writings and the relations of these to the cultural situations in which they were created.
120. THESIS.
 This seminar gives training in bibliography, selection of problems for critical writing, and leads to the presentation of a thesis. Students read and criticise each other's work at intervals and confer individually with the instructor.

Fine Arts

PROFESSOR: ROBERT M. WALKER, *Chairman*

ASSOCIATE PROFESSOR: HEDLEY H. RHYS

LECTURER: ANNA MARGUERITE McCANN

The aim of the Department is to study the historical-cultural significance and aesthetic value of architecture, sculpture, painting and graphic art (prints and drawings). Methods and problems of criticism are considered: observation, analysis, interpretation and evaluation. Instruction is given by means of original works of art as well as by the usual visual aids. Field trips are made to public and private collections in New York, Philadelphia, Baltimore and Washington and to significant examples of architecture in those areas.

Since it is the objective of the Department to foster an intelligent comprehension of the visual arts rather than to train professional artists, no courses in drawing, painting and sculpture are offered for credit. However, instruction in such work is available under the extracurricular Arts and Crafts Program.

REQUIREMENTS AND RECOMMENDATIONS

Prerequisites: Majors in course and majors and minors in honors must take the two half courses, Fine Arts 1 and 2. For other students the prerequisite for all advanced courses is one semester of the Introduction to Art History, either Fine Arts 1 or 2. Fine Arts 11, Design in Drawing and Painting, while not a prerequisite, is recommended as a foundation course for other Fine Arts courses and seminars.

Sequence of Courses: Whenever possible, majors will take courses in their numerical order. For other students courses need not be taken in numerical sequence.

Majors in Course: The program of a major consists of at least eight half courses (including Fine Arts 1-2) in the Department. The courses supporting this program depend on the needs of the individual student and may be found in both the Division of the Humanities and the Division of the Social Sciences.

Majors and Minors in Honors: Majors in honors take four seminars in the Department. In special cases the seminar in Aesthetics may be substituted for one in Fine Arts. A minor in honors usually consists of two seminars. The seminars offered in any one semester vary according to the requirements of the students and the convenience of the Department.

Language Requirements for Graduate Schools: Students are advised that graduate work in Fine Arts requires a knowledge of French or German.

COURSES

1. INTRODUCTION TO ART HISTORY. Mr. Walker and Miss McCann.

Fall Semester

Consideration is given in the first four weeks to the basic problems of the nature of the work of art, the factors of influence upon its conception, formation, and development (geographic, social, economic, etc.) the principles of value judgments, and methods of analysis. A limited number of representative examples

NOTE: Students other than majors in Fine Arts in course and majors and minors in Fine Arts in honors may take one semester of the Introduction to Art History, either Fine Arts 1 or 2, as a prerequisite for advanced courses.

of architecture, sculpture, and painting are studied within the historical context of the civilizations and cultural epochs which produced them: Ancient Egypt, Greece and Rome, and Medieval France.

Three hours of lecture a week and one bi-weekly conference hour.

2. INTRODUCTION TO ART HISTORY. Mr. Rhys and Miss McCann. *Spring Semester*
European and American architecture, sculpture, and painting from the fifteenth century to the present day are studied from the same points of view and with the same methods as in the first semester.
Three hours of lecture a week and one bi-weekly conference.
11. DESIGN IN DRAWING AND PAINTING. Mr. Rhys. *Fall Semester*
The basic elements of design and their function in drawing and painting. Types of harmony, sequence and balance such as linear, tonal and special. The methods of design and representation that characterize the various historical styles. Practical exercises required demand no special technical aptitude, since the purpose of the course is to develop a critical understanding of drawing and painting and not technical skill.
51. ANCIENT ART. Miss McCann. *Fall Semester*
The development of the forms of architecture, sculpture and painting as expressing various cultural patterns of the ancient civilizations of Greece and Rome.
52. MEDIEVAL ART. Mr. Walker. *Spring Semester*
A study of the relationship between art and society in Europe and the Near East from the fourth through the fourteenth centuries. This ideas and institutions which were instrumental in shaping Christian art during its formative stages of development. Special emphasis is placed on the Romanesque and Gothic periods in France: the abbey and the cathedral.
53. ITALIAN RENAISSANCE ART. Miss McCann. *Spring Semester*
A study of certain aspects of the art of the Renaissance in Italy as expressed in architecture, sculpture and painting. Emphasis is placed on such great masters as Donatello, Masaccio, Alberti, Leonardo da Vinci, Raphael, Michelangelo and Titian.
54. NORTHERN RENAISSANCE AND BAROQUE PAINTING. Mr. Walker. *Spring Semester*
Developments in painting and drawing during the fifteenth, sixteenth and seventeenth centuries in France, the Netherlands, Germany and Spain through the study of individual artists such as the Van Eycks, Roger van der Weyden, Jean Fouquet, Dürer, Gruenewald, Holbein, El Greco, Rubens, Rembrandt, Vermeer, Poussin and Velasquez.
55. MODERN PAINTING. Mr. Rhys. *Fall Semester*
Important stylistic developments in European painting from the French Revolution through Matisse and Picasso: the meanings of the various movements and their relationship to changing social and political attitudes.
56. AMERICAN ART. Mr. Rhys. *Fall Semester*
Architecture, sculpture and painting in North America from the Colonial Period to the present day, their connection with European art and their significance as a reflection of American culture.

57. MODERN BUILDING. Mr. Walker. *Spring Semester*
 An introduction to the nature of architecture and the function of the architect through a study of developments in European and American building during the late nineteenth and twentieth centuries. The specific influence of economic, technological and social changes upon design and structure. Emphasis placed on the study of original examples in the Philadelphia area and on the work of such men as Sullivan, Wright, Mies van der Rohe, Gropius and Le Corbusier. The prerequisite of Fine Arts 1-2 is waived for students in Engineering.
60. SENIOR CONFERENCE. Mr. Walker. *Spring Semester*

HONORS SEMINARS

100. MEDIEVAL ART. Mr. Walker. *Fall Semester*
 The development of the forms of Christian art during the Middle Ages, with special emphasis on the Romanesque and Gothic periods in France: the abbey and the cathedral.
101. ITALIAN RENAISSANCE PAINTING. Mr. Rhys. *Fall Semester*
 A study and analysis of painting in Italy from Giotto to Titian: the decisive contributions of the outstanding masters to its stylistic development and its relationship to the Renaissance movement as a whole.
102. NORTHERN RENAISSANCE. Mr. Walker. *Spring Semester*
 Developments in painting and the graphic arts of drawing and print making during the fifteenth century in England, France, the Netherlands, Germany, and Spain through an intensive study of individual masters such as the Van Eycks, Roger van der Weyden, Jerome Bosch, Pieter Brughel, Jean Fouquet, Martin Schongauer, Albrecht Dürer, Hans Holbein, and El Greco.
103. THE BAROQUE. Mr. Walker. *Fall Semester*
 Developments in painting and the graphic arts of drawing and print making during the seventeenth century in Western Europe. Although the role of Italy in the formation of the Baroque as an international style is studied, special orientation is found in the individual work of such great masters as Rubens, Rembrandt, Vermeer, Velasquez, and Poussin.
105. MASTER PRINT MAKERS. Mr. Walker. *Spring Semester*
 A consideration of certain problems in the history of the graphic arts. A study of the significance of the work of such men as Schongauer, Dürer, Rembrandt, Goya, Daumier, Munch and Rouault for the development of expression in the media of the woodcut, engraving, etching, aquatint and lithography. Students work almost exclusively with original material in the Print Room of the Philadelphia Museum and the Lessing J. Rosenwald Collection in Jenkintown.
106. PICASSO. Mr. Rhys. *Spring Semester*
 The art of Picasso: its formal and expressive vocabulary; its relationship to European and non-European artistic traditions; and its place in Twentieth Century painting.
107. ANCIENT ART. Mr. Walker. *Fall Semester*
 Classical Greek art and architecture within the art historical context of ancient civilizations of the Near East.

History

PROFESSORS: MARY ALBERTSON, *Chairman*

PAUL H. BEIK

FREDERICK B. TOLLES

ASSOCIATE PROFESSORS: JAMES A. FIELD, JR. *

LAURENCE D. LAFORE ‡

ASSISTANT PROFESSORS: ROBERT D. CROSS

PETER N. RIESENBERG ‡

INSTRUCTORS: JAMES M. BROUWER

HARRISON M. WRIGHT

LECTURER: JOHN I. CODDINGTON

The introductory courses (1 through 5x) as well as some of the more advanced courses are designed to familiarize students with contemporary American civilization: its European backgrounds; England's influence, particularly through her literature, her law, and her constitution; and the heritage and the place in the world of the United States itself. There is another group of courses (11 through 15) which are intended to introduce history majors as well as majors in other departments to the understanding of a foreign culture.

REQUIREMENTS AND RECOMMENDATIONS

FOR MAJORS AND MINORS

History 1-2 should be taken in the freshman year if possible. The work of the major in Course normally consists of at least six additional half courses in the department, including one or two half courses in American history, at least one half course in English history, and Special Topics. The comprehensive examination includes a choice of questions on the fields of European, English, and American history. Carefully planned election of related courses in other departments should begin in the sophomore year, particularly with reference to the prerequisite requirements of these departments for Honors seminars. Languages most useful to students of history are French, German, or Latin. A reading knowledge of at least one of these is required by most graduate schools. History majors are asked to take Philosophy 1.

The only requirement for acceptance as a major in history at the beginning of the junior year is successful completion of History 1-2.

‡ Absent on leave, 1957-58.

* Absent on leave, fall semester, 1957-58.

The department recommends that a Course major in the junior and senior years group his electives in such a way as to make a coherent program. The department records the field of special competence of its majors so that the information can be given in letters of recommendation, etc., when it is desirable; and selection of questions in the comprehensive examination may be guided by these interests. A major in history may, for example, be described as a major in history with emphasis on the social sciences, on American civilization, on international relations, or on Russian studies.

The student planning to apply for work leading to an Honors degree either as a major or minor should follow in general the same program as the Course major during his first two years. He should normally, if he has room for history in his program during his sophomore year, choose either a half course in American history (4, 5, 4x, or 5x) or a half course in English history (3). If the choice has to be made between a second course in American history and a first course in English history, the latter should be chosen.

COURSES

No course open to sophomores covers the same ground as an Honors seminar.

1-2. EUROPE. All members of the department. *Full Course*

One of the basic courses in the curriculum. It is an introduction to the study, understanding, and use of history for those who do not plan to take any more courses in history as well as for those who do. It is a prerequisite to all other work in history except course 61. The course begins with the classical backgrounds of European civilization and ends with post-war Europe. Sections are small enough for discussion.

NOTE: History 1 may be used to meet part of the requirement of four half courses in four different departments whether it is taken alone or in combination with History 2. In certain combinations History 1 may be given credit without History 2, if written permission is obtained from the chairman of the department.

1x. A course paralleling History 1-2 in chronology, planned for those who already have some background in European history.

Not offered in 1957-58.

3. ENGLAND. Miss Albertson. *Spring Semester*

A survey of the history of the English people.

4, 5. THE UNITED STATES BEFORE 1865. Mr. Cross or Mr. Field.

A general course beginning with the history of the colonies, bringing the narrative to 1865 at the end of the first half. Either half course may be taken separately.

4x, 5x. AMERICAN INTELLECTUAL HISTORY. Mr. Cross or Mr. Tolles.

A course paralleling 4, 5 in chronology, recommended for those who have had a considerable amount of work in American history.

11. THE OTHER AMERICAN REPUBLICS. Mr. Lafore.
The development of Latin America with its European and colonial background. The emphasis is on Mexico, Brazil, and Argentina. This is recommended for majors in Spanish as well as for majors in history, and as a general elective.
Not offered in 1957-58.
14. RUSSIA. Mr. Beik. *Fall Semester*
The history of modern Russia. The course begins with the reign of Peter and gives half its time to the period since the Revolution.
- 15, 16. THE EXPANSION OF EUROPE. Mr. Brouwer.
Topics in different aspects of European expansion from the sixteenth century to the present, with emphasis on the relation between European and non-European factors. Either half course may be taken separately.
The following courses are not open to freshmen and sophomores. Exceptions are made only on written approval by the chairman of the department.
52. MODERN BRITAIN. Mr. Lafore.
The development of a modern industrial society and welfare state.
Not offered in 1957-58.
53. THE FRENCH REVOLUTION AND NAPOLEON. Mr. Beik.
The significance of the period of 1789-1815 in the development of modern European social theories and political institutions.
54. MEDIEVAL EUROPE. Miss Albertson or Mr. Riesenber.
The history of western Europe from the decline of the Roman empire through the thirteenth century.
56. AMERICAN DIPLOMATIC HISTORY. Mr. Field. *Spring Semester*
Official United States foreign policy considered as a part of the larger problem of American participation in world affairs.
Not offered in 1958-59.
57. MODERN EUROPE. All members of the department.
Recent European problems and institutions examined primarily through the experiences of one nation in the nineteenth and twentieth centuries. In 1957-58 the nation studied will be France.
61. QUAKERISM. Mr. Tolles. *Spring Semester*
The history of the Society of Friends to the present day. The characteristic religious and social ideas of the Quakers are considered in their historical setting.
Not offered in 1958-59.
62. THE NEAR AND MIDDLE EAST. Mr. Coddington.
The history of this area in modern times.
Not offered in 1958-59.
- 63, 64. THE FAR EAST.
A general course concerned chiefly with China in the first half, with Japan in the second half.
Not offered in 1957-58.

65, 66. SPECIAL TOPICS. All members of the department. *Spring Semester*

For seniors. Individual programs are planned to prepare majors in history for the comprehensive examinations. The discussion of review problems, of papers, and of reading is conducted in groups and in individual conferences with members of the department. This may be elected as a single one-semester course or as a double one-semester course.

HONORS SEMINARS

The following seminars are offered by the department to juniors and seniors to prepare for the examinations for a degree with Honors. They may be taken in any combination without regard to chronological order. The only prerequisite is History 1-2 except for seminars 102, 103, and 104. For these some work in American history beyond the secondary school level is also required; this prerequisite may be fulfilled either by a semester course (History 4, 5, 4x, or 5x) or by special arrangements made with the instructor of the seminar.

Those who wish to specialize in international relations with a major in history (see p. 113 last paragraph) should include in their programs at least three of the following seminars: numbers 103, 110, 116, 117.

The United States

101. EARLY AMERICAN HISTORY. Mr. Tolles. *Fall Semester*

Political, economic, social, and cultural aspects of the period from the explorations to the end of the American Revolution.
Not offered in 1958-59.

102. PROBLEMS IN AMERICAN HISTORY. Mr. Cross or Mr. Field.
Selected topics in the history of the United States.

103. PROBLEMS IN AMERICAN HISTORY: FOREIGN. Mr. Field. *Spring Semester*
The United States in the world community: a study of the evolution since 1776 of American policies toward Europe, Latin America, and the Orient, with emphasis on ideological, economic, and strategic developments.
Not offered in 1958-59.

104. THE SUPREME COURT. Mr. Cross.
A history of the role played by the Supreme Court in American political, economic, and social life. The seminar is not designed to anticipate or overlap the courses in constitutional law offered in law schools.

England and the Commonwealth

106. MEDIEVAL ENGLAND. Miss Albertson.
From 1066 to 1485. Social and political origins, the development of representative institutions and of the Common Law.

107. TUDOR AND STUART ENGLAND. Miss Albertson.
The English Renaissance and Reformation, constitutional theory, the Civil War and the Restoration.

109. MODERN ENGLAND. Mr. Lafore.
The nineteenth century.
Not offered in 1957-58.

110. THE BRITISH EMPIRE. Mr. Wright.

Spring Semester

A study of the empire from sixteenth century origins to the present. Special attention is paid to the growth of the "second empire" and the internal history of the members of the present commonwealth.

Europe

111. MEDIEVAL EUROPE. Mr. Riesenbergl.

The civilization of the twelfth and thirteenth centuries in continental Europe.

112. THE RENAISSANCE AND REFORMATION. Miss Albertson.

Continental Europe from the fourteenth to the seventeenth centuries.

114. EUROPE 1760 to 1870. Mr. Beik.

The disintegration of the old regime and the rise of liberalism.

115. EUROPE 1870 TO 1939: MODERN EUROPE. Mr. Coddington or Mr. Lafore.

Political and social changes in western Europe which preceded the second world war.

116. EUROPE SINCE 1870: DIPLOMATIC HISTORY. Mr. Lafore.

The management of international affairs and problems.

Not offered in 1957-58.

117. EUROPE SINCE 1870: EASTERN EUROPE. Mr. Beik.

The origins and consequences of the Russian Revolution and of the formation of the succession states.

THESIS (120)

A thesis may be substituted for one of the Honors examinations by special permission of the department. The topic should be selected and approved by the end of the junior year.

GRADUATE WORK

The department of History offers work leading to the Master's degree for graduate students who wish to use the research resources of the Friends Historical Library for a thesis. In addition to the thesis the candidate normally takes three Honors seminars. For the general regulations concerning the Master's degree see p. 64.

International Relations

Students who plan to enter upon a career in the field of international relations should include in their programs, during the first two years, the introductory courses in economics, history, and political science and should complete the intermediate course in one or more modern languages.

Advanced courses selected from the groups listed below may be incorporated in the programs of students who do their major work in economics, history, political science, or a modern language.

Those students who wish to concentrate in international relations may take their Senior Comprehensive Examination in this field. Students preparing for this examination should take eight, nine, or ten half courses from among those listed below, including all of those listed in Group I, one or more in Group II, and one or more in Group III. The examination is administered by a committee appointed by the chairmen of the Departments of Economics, History, and Political Science, under the Chairmanship of the Department of Political Science.

Group I

- Political Science 12. INTERNATIONAL POLITICS.
- Political Science 13. INTERNATIONAL LAW AND ORGANIZATION
- Political Science 57-58. AMERICAN FOREIGN POLICY
- Economics 60. INTERNATIONAL ECONOMICS

Group II

- History 11. THE OTHER AMERICAN REPUBLICS
- History 14. RUSSIA
- History 62. THE NEAR AND MIDDLE EAST

Group III

- Political Science 15. COMPARATIVE GOVERNMENT
- Political Science 19. THE SOVIET SYSTEM
- Political Science 20. FAR EASTERN POLITICS
- Political Science 59. MODERN POLITICAL THEORY

Students who plan to enter the Honors program will find it possible to select a similar combination of courses and seminars in the field of international relations. In planning such programs, they should consult with the chairmen of their prospective major departments.

Mathematics

PROFESSOR: HEINRICH BRINKMANN, *Chairman*

ASSOCIATE PROFESSOR: PHILIP W. CARRUTH

ASSISTANT PROFESSORS: EDGAR R. MULLINS, JR.

DAVID ROSEN

Pure mathematics is an abstract subject and may be looked upon as the model of a deductive science. On the other hand, the subject matter of mathematics has for the most part arisen out of concrete applications to the physical sciences, among which geometry occupies a central position. The courses offered in the department of Mathematics attempt to combine these points of view and to give a picture of the power and beauty of the subject when studied for its own sake, as well as its many relations to other fields of thought. The study of mathematics is essential as a tool for the understanding of the principles of the physical sciences and engineering; a knowledge of its techniques is indispensable for a successful pursuit of these subjects. The same is becoming increasingly true in the biological sciences and in some of the social sciences.

For students who intend to major in mathematics in course, the normal sequence of courses is the following: Freshman year, courses 3-4; Sophomore year, courses 11-12; Junior and Senior years, two half-courses selected each year from courses 13, 14, 51, 52, 54. The completion of Physics 1-2 is strongly recommended.

In order to be admitted to honors seminars in mathematics, either as a major or as a minor, a student must have completed courses 11-12. An honors student whose major is mathematics must also take Physics 1-2; it is furthermore highly desirable that he have a reading knowledge of French or German. A junior honors student will normally take the seminars in Advanced Calculus and Differential Equations; these seminars are offered each year. The remaining seminars are usually taken by senior students and are offered as they are required.

1-2. INTRODUCTION TO MATHEMATICS.

Full Course

The purpose of this course is to acquaint the student with the principles and some of the fundamental concepts of mathematics. While a part of the course will deal with the ideas and applications of elementary calculus, other fundamental concepts of mathematics will also be considered, and in particular appropriate material from algebra and trigonometry will be studied. An introduction to statistics and probability will be given as an application. The course is suitable for a terminal course in mathematics, particularly for students in the social sciences. It may also be used as a prerequisite for further work in mathematics, and should be taken by those students intending further study of mathematics who do not have the preparation necessary for courses 3-4.

3-4. FIRST YEAR MATHEMATICS.

Full Course

The subject matter of these courses consists of calculus combined with appropriate material from analytic geometry. It will normally be followed by courses 11-12 and should be taken by students intending to do their major work in mathematics, the physical sciences, or engineering. Good preparation, including a thorough course in trigonometry, is required as preparation for this course.

11-12. CALCULUS.

Full Course

In this course the student continues the study of the calculus begun in Mathematics 3-4; certain topics from algebra and analytic geometry are also included. The course forms a necessary basis for any further work in mathematics and is essential for an understanding of the fundamentals of physics and other sciences, as well as engineering. The two halves of this course cannot be taken separately.

Prerequisite: Courses 3-4.

13. HIGHER GEOMETRY.

Fall Semester

Various kinds of geometry (mostly in the plane) will be studied in this course, using both analytic and synthetic methods. A large part of the work will deal with projective geometry and its relation to metric and other geometries. The conic sections will be studied in some detail.

Prerequisites: Courses 11-12.

14. HIGHER ALGEBRA.

Spring Semester

The purpose of this course is to introduce the student to some of the abstract ideas that are fundamental in the subject of algebra as well as to extend his knowledge of certain algebraic techniques. Among the subjects studied are: Number systems, fields and their algebraic extensions, matrices and determinants, the solution of algebraic equations, systems of linear equations.

Prerequisites: Courses 11-12.

51. ADVANCED ANALYSIS I.

Fall Semester

This course deals with the differential calculus of functions of several variables and its geometric applications, multiple integrals, line and surface integrals, improper integrals and infinite series. The treatment is sufficiently rigorous to strengthen the student's understanding of the principles of the calculus. Applications to the physical sciences are given whenever possible.

Prerequisites: Courses 11-12; these courses must be passed with a grade of C or better.

52. ADVANCED ANALYSIS II.

Spring Semester

This course is a continuation of Mathematics 51. Some of the topics studied are: Ordinary Differential Equations, with applications; Infinite Series; Improper Integrals and the Gamma Function.

Prerequisites: Courses 11-12, 51.

54. PROBABILITY AND STATISTICS.

Spring Semester

This course deals with the mathematical theory of statistics, based upon a study of the theory of probability. An introduction to the theory of sampling and statistical inference will be given.

Prerequisites: Courses 11-12, 51 (Course 51 may be taken concurrently).

55. SENIOR CONFERENCE.

Spring Semester

A weekly meeting held for the purpose of integrating and supplementing the course program of majors in this department.

60. READING COURSE IN MATHEMATICS.

This course is to provide an opportunity for students to do special work in fields not covered by the undergraduate courses, listed above. The work consists in the preparation of papers requiring extensive and detailed examination of the literature of a problem.

Note: Courses 51 and 52 may be presented for an Honors examination as part of an Honors program.

HONORS SEMINARS

101. ADVANCED CALCULUS.

Fall Semester

The subject matter of this seminar includes the differential calculus of functions of several variables, the elements of vector analysis, multiple integrals, line and surface integrals, improper integrals, infinite series, uniform convergence of infinite processes. The treatment of these various subjects is sufficiently detailed to give the student an introduction to the rigorous processes of analysis.

102. DIFFERENTIAL EQUATIONS.

Spring Semester

This seminar continues the study of the topics listed under the seminar in Advanced Calculus. It also includes a formal treatment of ordinary differential equations and their applications to various types of problems. This is followed by a study of existence theorems for ordinary differential equations, certain classical linear differential equations, Fourier series and a brief introduction to boundary value problems of certain partial differential equations of the second order.

103. STATISTICS AND PROBABILITY.

The purpose of this seminar is to give the mathematical background necessary for an understanding of the mathematical analysis of statistical data. In addition the modern development of this subject provides a valuable application of the concepts and techniques acquired in the study of advanced calculus. The topics treated include: the axiomatic approach, the use of Stieltjes integrals, correlation and regression, some special distributions, sampling theory and a short introduction to the theory of statistical estimation.

104. MODERN ALGEBRA.

This seminar deals with the theoretical properties of such formal systems as groups, rings, fields and vector spaces. While these concepts will be illustrated by many concrete examples, the emphasis will be on the abstract nature of the subject; the student will thus be introduced to an important aspect of modern mathematics. Among the specific topics to be studied are the algebra of matrices, of classes and of ideals.

105. THEORY OF FUNCTIONS OF A COMPLEX VARIABLE.

A brief study of the geometry of complex numbers is followed by a detailed treatment of the Cauchy theory of analytical functions of a complex variable. Various applications are given and some special classes of functions, such as elliptic functions, are studied. Analytic continuation and the theory of Weierstrass are briefly considered.

106. THEORY OF NUMBERS.

Among the subjects studied in this seminar are: Elementary properties of integers, the congruence relation, quadratic residues, quadratic forms, certain classical Diophantine equations, simple examples of fields of algebraic numbers.

107. DIFFERENTIAL GEOMETRY.

The subject of this seminar is the metric differential geometry of curves and surfaces in three dimensional space.

108. SYMBOLIC LOGIC.

This seminar is given by the Department of Philosophy. A description of it will be found under the offerings of that department. It may be presented as part of the Mathematics program in Honors.

Modern Languages and Literatures

PROFESSORS: EDITH PHILIPS, *Chairman* (French) †
HAROLD MARCH (French)

ASSOCIATE PROFESSORS: HILDE D. COHN (German)
FRANZ H. MAUTNER (German)
JAMES D. SORBER (Spanish)

ASSISTANT PROFESSORS: FREDERIC GROVER (French)
JUSTUS ROSENBERG (German and Russian)
ELISA ASENSIO (Spanish)
JEANNE THEIS WHITAKER (French) *

LECTURERS: OLGA LANG (Russian)
JEAN ASHMEAD PERKINS (French)

ASSISTANT: NICOLE TISSOT CROSBY (French)

The department of modern languages and literatures aims to give its majors a comprehensive view of the literature and culture represented by these languages, in relation to other humanistic studies. Courses are conducted in the language of the literature being studied, and progress in the language is always one of the aims.

The elementary and intermediate courses are designed to prepare the students for advanced work in literature as well as to meet college and departmental requirements. It is not impossible, with some extra reading, to major or to enter honors seminars in a language started in college. Prerequisites and recommended subjects for majors are noted under the listing of each language section.

French

All students offering French for entrance are placed at the level where they will presumably profit best by the course, according to their rating in the College Entrance Examination or a test given by the department.

French may be offered as a major in course or as a major or minor in honors work. Prerequisites and recommended supporting subjects are the same for both course and honors students and are as follows:

Required:

French 11, 12 Introduction to Literature, or evidence of equivalent work.
French 5 Advanced Composition and Diction.

Recommended supporting subjects:

History of France, History of Modern Philosophy, Psychology, courses in other literatures, Fine Arts.

Majors are expected to speak French with sufficient fluency to take part in discussion in courses and seminars in the language and to pass an oral comprehensive or oral honors examination in French.

NOTE: All advanced courses are not offered every year. Students wishing a major or minor in French should plan their course carefully in advance with the department in order to get a well rounded program.

† Absent on leave, spring semester, 1957-58.

* Absent on leave, fall semester, 1957-58.

COURSES

1-2. ELEMENTARY FRENCH.

For students who begin French in College. Equivalent to two years' French in high school. The initial approach is oral but a foundation is laid for a reading knowledge. No credit is given for French 1 alone. Both courses offered each semester.

3, 4. INTERMEDIATE FRENCH.

For students who have had French 1-2 or its equivalent (2 years' French in high school). Students who have had three years in high school usually enter French 4. Grammar is reviewed. Reading is from contemporary literature in French editions without notes or vocabulary. Every effort is made to help the student to increase his vocabulary and to discuss what he has read in the French language. Completion of French 4 satisfies the language requirement. The normal course to follow French 4 is French 11. (Both courses are offered each semester.)

5, 6. ADVANCED COMPOSITION AND DICTION.

For those who intend to major in French or who wish an advanced course in which the emphasis is not primarily literary. An effort is made to correct faulty pronunciation and to improve self-expression in the language, both oral and written.

11, 12. INTRODUCTION TO LITERATURE.

In Course 11 the transition is made from reading as an aid to language learning to the consideration of literary values. The material is selected from classics of the nineteenth century, but it is not a systematic survey course. Prerequisite: French 4 or equivalent.

In Course 12 the treatment is more historical with selected readings in Larousse editions from Rabelais to Rousseau. (Both courses are offered each semester.)

14. PROSE DE LA RENAISSANCE.

Readings from Rabelais, Calvin, Montaigne.

15. L'ÂGE DE LOUIS XIV.

Selected prose and poetry of the seventeenth century exclusive of the theater.

16. LES "PHILOSOPHES."

Montesquieu, Voltaire, Diderot and Rousseau; their contribution to the development of the ideas on art, literature and society which characterize the French eighteenth century.

17. THÉÂTRE CLASSIQUE.

The plays of Corneille, Racine and Molière and the growth of the classic ideal in French literature.

21. LITTÉRATURE DU MOYEN ÂGE.

Readings from medieval literature in modern French translations.

22. ROMAN MODERNE.

Representative novelists from Balzac to Proust.

24. MALRAUX, SARTRE, CAMUS, MAURIAC.

Neo-humanism and contemporary tendencies.

25. LE ROMAN AU 17^e ET 18^e SIÈCLES.

Selected novels before Balzac.

30. HISTORY OF IDEAS.

Ideological background of modern literature. (Given in English.)

51. SPECIAL TOPICS. (For senior majors).

Readings selected to fit the needs of individual seniors and to supplement their selection of courses. Not designed to prepare for any specific type of comprehensive examination but to give an opportunity in the senior year for the student to see his courses in perspective and to see possible relationships with work in other fields.

HONORS SEMINARS

100. LITTÉRATURE DU MOYEN AGE.

Old French readings in lyric poetry, theater and fiction.

101. LA RENAISSANCE EN FRANCE.

Rabelais, Calvin, Montaigne, Ronsard et la Pléiade.

102. LE THÉÂTRE CLASSIQUE.

Corneille, Racine, Molière.

103. LE SIÈCLE DES PHILOSOPHIES.

Montesquieu, Voltaire, Diderot, Rousseau.

104. BALZAC, STENDHAL, FLAUBERT, PROUST.

106. POÉSIE MODERNE.

Baudelaire, Rimbaud, Verlaine, Mallarmé, Claudel, Verlaine, Valéry.

107. MODERN EUROPEAN LITERATURE. (Given in English.)

Four or five selected authors from German, French, English and Russian literature.

108. LE ROMAN DU 20^e SIÈCLE.

While some honors seminars treat the same subject matter as the courses, the reading required is more extensive both in the texts and in critical material. The work of a seminar corresponds to two half courses.

German

ASSOCIATE PROFESSORS: HILDE D. COHN
FRANZ H. MAUTNER

ASSISTANT PROFESSOR: JUSTUS ROSENBERG

All students offering German for entrance are placed at the level where they can presumably profit best by the course, according to their rating in the College Entrance Examination or a test given by the department.

German may be offered as a major in course or as a major or minor in honors work. Prerequisites and recommended supporting subjects are the same for both course and honors students and are as follows:

Required:

German 11-12. Introduction to German Literature.

Recommended supporting subjects:

An advanced course in German literature, Shakespeare, Modern Philosophy, Psychology, Fine Arts, courses in other literatures, History of Germany.

As far as possible German is the language of the classroom in all advanced courses and seminars. Since not all advanced courses and seminars are offered every year, students wishing a major or minor in German should plan their courses carefully in advance with the department in order to get a well rounded program.

1-2. ELEMENTARY GERMAN.

For students who begin German in college. Equivalent of two years' secondary school preparation. Fundamentals of German and easy literary prose such as Schnitzler: *Der blinde Geronimo*.

3. INTERMEDIATE GERMAN.

Prerequisite: German 1-2 or two years' secondary school preparation. Review grammar and narrative and expository prose of average difficulty such as Hesse: *Knulp*; Schweitzer: *Leben und Denken*.

4. INTERMEDIATE GERMAN.

Fulfills the college requirement for all students who wish to learn reading and speaking. Literary narrative, drama, poetry, expository prose of greater difficulty. Prerequisite: German 3 or equivalent.

6. WRITING AND SPEAKING GERMAN.

Composition and conversation.
Prerequisite: Course 3-4 or equivalent.

7-8. ELEMENTARY GERMAN (SPECIAL READING COURSE).

A special reading course designed for those who wish to acquire a reading knowledge of German in a single year. German 7-8 may be used to fulfill the requirements of certain departments or of graduate schools, but not to satisfy the college foreign language requirement.

11, 12. INTRODUCTION TO GERMAN LITERATURE.

A study of representative German authors; reading and discussion of dramas, novellen, and lyric poems. Not a survey course. Writing of critical reports. Prerequisite: German 4 or equivalent.

13. DIE DEUTSCHE ROMANTIK.

An introductory study of the Romantic movement in Germany, with illustrative readings from representative authors such as Novalis, Tieck, Arnim, Brentano, Eichendorff. Lectures, discussion, papers in German.

Prerequisite: Course 11-12 or equivalent.

14. DIE DEUTSCHE NOVELLE VON GOETHE BIS THOMAS MANN.

Significant examples of this typically German genre will be read and interpreted as to contents, form and historical importance, as well as its relations to other European literatures. Authors: Goethe, Eichendorff, Kleist, Stifter, Meyer, Keller, Storm, Thomas Mann.

15. DIE GOETHE-ZEIT.

Goethe, Schiller and their contemporaries. The most significant works will be studied.

17. GOETHES FAUST. DER TRAGOEDIE ERSTER UND ZWEITER TEIL.

An intensive study of *Faust I*, and *II*. Also for students who only know *Faust, Part One*.

18. MODERNE DEUTSCHE LITERATUR.

A study of leading German writers of the twentieth century, including Gerhart Hauptmann, Thomas Mann, Rainer Maria Rilke, Hofmansthal. Lectures, discussion, papers.

Prerequisite: Course 11-12 or equivalent.

20. DIE DEUTSCHE LYRIK.

A critical study of German poetry from the classical age to the present time. The interrelation of form and "contents." Reading will include, among others, Goethe, Schiller, Hölderlin, Eichendorff, Heine, Mörike, Meyer, George, Rilke.

HONORS WORK

The following seminars prepare for examinations for a degree with Honors. Those actually given in any year vary according to the choices of the students and the convenience of the department.

101. MIDDLE HIGH GERMAN LITERATURE AND PHILOLOGY.

Introduction into Indo-European and Germanic philology and phonetics. Outline of development of the German language. Middle High German grammar. Brief survey of Old and Middle High German literature. Reading of MHG texts in the original, especially *Nibelungenlied*, Wolfram's *Parzival*, and Walther von der Vogelweide.

102. THE AGE OF LUTHER.

Study of literary, historical, sociological and religious problems of the sixteenth century. Reading of outstanding authors of the period, such as Luther, Hans Sachs, Brant, Hutten, Fischart. A course or seminar in History of the Reformation is recommended as preparation for this seminar.

103. DEUTSCHES BAROCK UND AUFKLAERUNG.

A study of German literature in the seventeenth and early eighteenth centuries. The reforms of Opitz, the lyric poetry of the period, the mysticism of Angelus Silesius and Jakob Böhme, the plays of Gryphius, and the prose of Grimms-hausen; a study of Lessing in his most important dramas and critical writing.

104. GOETHE.

Goethe's most significant works and his rôle in German intellectual history will be studied.

105. **DIE DEUTSCHE ROMANTIK.**
Romanticism as the dominant movement in German literature and thinking of the first half of the nineteenth century.
106. **DIE LITERATUR DES "REALISMUS".**
Studies in the works of Grillparzer, Heibel, Ludwig, Keller, Meyer, and Storm, and other writers of the drama, novel, and "Novelle" in the second half of the nineteenth century.
107. **DEUTSCHE LITERATUR SEIT 1900.**
The chief writers from naturalism to expressionism: Gerhart Hauptmann's dramas; Thomas Mann's prose; Rainer Maria Rilke's poetry; Hugo von Hofmannsthal's prose and poetry; Kafka, Brecht.
108. **DAS DEUTSCHE DRAMA.**
Representative examples of the dramatic genre in German literature from the end of the 18th century to the present.
130. **LINGUISTIC SCIENCE.** (In cooperation with other departments in the Division of the Humanities.)
The most important problems of Linguistics, e.g., sound change, changes in accidence and syntax, semantic changes, geographical distribution and relation of languages. Indo-European, English, and American language problems. Relationship between linguistics and psychology. Some knowledge of German, French, Latin, or Greek is desirable, reading knowledge of at least one foreign language required. Students who know non-Indo-European languages are especially welcome. The seminar is conducted in English.

Russian

ASSISTANT PROFESSOR: JUSTUS ROSENBERG

LECTURER: OLGA LANG

Courses in the Russian language may be used to fulfill the college's foreign language requirement. A major in Russian language and literature may be obtained by taking the courses listed below and additional courses offered at Bryn Mawr College. These courses are part of the Russian Studies program offered at Bryn Mawr, Haverford, and Swarthmore Colleges (see p. 149).

- 1-2. **ELEMENTARY RUSSIAN.** *Full Course*
Vocabulary and grammar. Oral and written translations from English into Russian and vice versa. Vocabulary building. Reading of short stories. Books: *Essentials of Russian* (Prentice-Hall), *Stories by Lermontoff and Pushkin* (Heath series). Five hours a week.
- 3, 4. **INTERMEDIATE RUSSIAN.**
Review of grammar with special emphasis on use of prepositions, verb forms, numerals. Short area study, geography and history of Russia to the revolution of 1917. Advanced reading and composition. Books: *Essentials of Russian* (Prentice-Hall), *Russian Area Reader* (Ronald Press).

Spanish

ASSOCIATE PROFESSOR: JAMES D. SORBER

ASSISTANT PROFESSOR: ELISA ASENSIO

All students offering Spanish for entrance are placed at the level where they will presumably profit best by the course according to their rating in the College Entrance examination or a test given by the department.

Spanish may be offered as a major in course or as a major or minor in honors work. Prerequisites and recommended supporting subjects are the same for both course and honors students and are as follows:

Required: Spanish 11-12 Introduction to Literature.

Recommended supporting subjects:

Introduction to Philosophy, Psychology, English or other foreign or classic literature, Fine Arts, South American History.

Majors are expected to speak Spanish with sufficient fluency to take part in discussion in courses and seminars in the language and to pass an oral comprehensive or oral honors examination in Spanish.

COURSES

1-2. ELEMENTARY SPANISH.

For students who begin Spanish in college. Equivalent to two years' Spanish in high school. The emphasis is both on the spoken language and on reading.

3, 4. INTERMEDIATE SPANISH.

For students who have had Spanish 1-2 or its equivalent (two years in high school). Students who have had three years usually enter Spanish 4. Grammar is reviewed. Reading is from Spanish and South American literature with emphasis on increasing the student's vocabulary and his ability to discuss his reading in oral and written Spanish.

9. ADVANCED COMPOSITION AND DICTION.

For majors and others who wish an advanced course in which the emphasis is not primarily literary. An effort is made to correct faulty pronunciation and to improve self expression in the language both oral and written.

11, 12. INTRODUCTION TO SPANISH LITERATURE.

Representative texts of modern Spanish and Latin American writers. Conducted in Spanish with frequent written work in Spanish.

13. EL TEATRO MODERNO.

Plays of the major Spanish writers in the nineteenth and twentieth centuries.

14. LA NOVELA HISPANOAMERICANA.

Representative novelists from Mármol in Argentina to Revueltas in Mexico.

15, 16. LAS OBRAS DE CERVANTES.

Novelas ejemplares. The *Quixote*. (A year course giving a thorough study of Cervantes. The first semester may stand alone.)

18. LA NOVELA EN LOS SIGLOS XIX Y XX.

Outstanding novelists from Romanticism to the present.

20. SPECIAL TOPICS FOR SENIOR MAJORS.

Readings selected to fit the needs of seniors and to supplement their selection of courses. Not designed to prepare for any specific type of comprehensive examination, but to give an opportunity in the senior year for the student to see his courses in perspective and to see possible relationships to work in other fields.

SEMINARS

101. LA NOVELA HISPANOAMERICANA.

102. LA NOVELA ESPAÑOLA DEL SIGLO XIX.

103. LAS OBRAS DE CERVANTES.

104. EL TEATRO MODERNO.

105. POESIA, TEATRO Y NOVELA DEL SIGLO DE ORO.

NOTE: While the titles of seminars in Spanish correspond to the titles of courses, honors students read more extensively both in the texts and critical work. The work of a seminar corresponds to that of two half courses.

Music

PROFESSOR: ALFRED J. SWAN, *Chairman*

ASSISTANT PROFESSOR: PETER GRAM SWING

LECTURER: WILLIAM H. REESE

The Department of Music is concerned with a broad outlook on the history of music, an appreciation of music based on intelligent listening, a knowledge of the music of particular periods and forms, and a stimulation of creative work by classes in elementary composition and by the supervision of free composition by more advanced students.

The courses outlined below fall into two categories. Historical courses serve to acquaint students with representative compositions from the early Christian era to modern times, and to train them in procedures of analysis that will equip them for historical research. Theoretical courses are designed to give the student a working basis in the materials of music and analysis as well as to prepare him for essays in free composition. Courses in both categories are devised so as to serve in the more elementary stages every music lover, and in the later stages the more specialized student who may desire to make music his profession.

REQUIREMENTS AND RECOMMENDATIONS

Music majors in Course or Music majors and minors in Honors will be directed along these two channels with emphasis on one or the other, in rarer instances on both. The minimum requirement for a major in Music is eight half-year courses, four in theory or composition and four in history. (Under certain conditions a student may be permitted to take six half-year courses in history plus two in theory). Majors in course will normally be required to take ten half-year courses; majors in Honors four half-year courses plus four seminars. Candidates for a minor in Honors are required to meet the same standards of preparation demanded of a candidate for a major in Honors.

Music 1-2 and 11-12 are required for all music majors. They should be taken no later than the Sophomore year and must be passed with a grade of B or higher. Music 61-62 is required for all students concentrating in music history. It will be offered every other year and should thus be taken either in the Junior or Senior year. Other upper-level history courses will be offered periodically and students concentrating in music history will select a minimum of two such courses.

Music 71-72 is conducted for composers who have advanced in free composition for the purpose of reviewing, integrating and supplementing their work especially in the larger forms.

It is recommended that music majors possess skill in playing a keyboard instrument and that they participate in the chorus or orchestra.

History of Music

- 1, 2. THE HISTORY OF MUSIC IN WESTERN CIVILIZATION. Mr. Swing.
This course has two main objectives: to teach students to listen intelligently to music and to acquaint them with representative works from successive periods of music history, thereby furnishing the basis for a growing and life-long interest in music. Open to all students.
Music 1 is a prerequisite for Music 2.
25. THE HISTORY OF RUSSIAN MUSICAL CULTURE. Mr. Swan.
This semester course is given, from time to time, for students who have taken Music 1-2, or those who are generally interested in the Russian Studies Program.
27. MOTET AND MADRIGAL IN TUDOR ENGLAND. Mr. Swing. *Fall Semester*
This course has as its objective the study of form and style as applied to a particular corpus of music. It aims to train the student in analytical procedures that can be used in the study of all choral music. While examples will be drawn primarily from Tudor sources, contemporary Italian and Flemish compositions will also be examined. Major emphasis will be given to performance in class; therefore students will be expected both to read vocal scores and to sing (or play) parts with proficiency. The course is open to students with the consent of the instructor.
Not offered in 1957-58.
28. MOZART. Mr. Swing. *Spring Semester*
A study of representative works in the light of modern criticism.
Not offered in 1957-58.
29. J. S. BACH. Mr. Swing. *Fall Semester*
A study of representative works in different genres with particular emphasis on choral works (including the Mass in B minor).
Prerequisite: Music 1-2 (or the equivalent).
31. HISTORY OF ORCHESTRATION.
Not offered in 1957-58.
32. HISTORY OF THE STRING QUARTET. Mr. Swing. *Spring Semester*
A study of the string quartet with emphasis on its development as a genre. Representative works from the classic, romantic and modern period will be studied and, whenever possible, performed in class. Open to students with the consent of the instructor.
- 53-54. MODERN MUSIC. Mr. Swan. *Full Course*
A study of the entire modern field, by schools and distinct characteristics. Conducted as a seminar with frequent recourse to original sources, such as statements, messages and rare scores by living composers, and also with occasional participation by visiting musicians.
- 61-62. PROBLEMS IN MUSIC HISTORY. Mr. Swing. *Full Course*
This course will select certain periods in music history for study and comparison. Emphasis will be given to analysis of musical structure and style with the study of primary and secondary sources (theoretical works, criticism, letters, etc.), brought in where appropriate. Open to students with the consent of the instructor.

HONORS SEMINARS

127. MOTET AND MADRIGAL IN TUDOR ENGLAND.
128. MOZART.
129. J. S. BACH.
131. HISTORY OF ORCHESTRATION.
132. HISTORY OF THE STRING QUARTET.
153. MODERN MUSIC, PART 1. *Full Semester*
154. MODERN MUSIC, PART 2. *Spring Semester*
161. PROBLEMS IN MUSIC HISTORY, PART 1. *Full Semester*
162. PROBLEMS IN MUSIC HISTORY, PART 2. *Spring Semester*

Theory and Composition

- 11-12. ELEMENTARY MUSIC THEORY. Mr. Reese. *Full Course*
This course deals with the general foundations of the musical language—scales, intervals, rhythm, formation of melodic patterns and their notation—and leads to elementary chord formation. Ear training is an important factor throughout the course.
- 21, 22. ELEMENTARY MUSIC COMPOSITION. Mr. Swan. *Full Course*
After practice in melodic patterns—the invention of his own *canti firmi*—the student applies to them imitational devices (two and three part imitation). Harmonization is taken up simultaneously. From short vocal compositions in motet form the student passes to trios for strings or wind, or combinations with piano. A pianistic exposition in abbreviated sonatina form may be attempted at the end of the year.
- 51, 52. ADVANCED MUSICAL COMPOSITION. Mr. Swan.
71, 72. TUTORIAL. The Staff.

HONORS SEMINARS

151. ADVANCED MUSICAL COMPOSITION, PART 1. *Full Semester*
152. ADVANCED MUSICAL COMPOSITION, PART 2. *Spring Semester*
171. TUTORIAL.

Philosophy and Religion

PROFESSORS: RICHARD B. BRANDT † *Chairman*
JOHN M. MOORE

ASSOCIATE PROFESSOR: MONROE C. BEARDSLEY

ASSISTANT PROFESSOR: MICHAEL SCRIVEN

INSTRUCTORS: JEROME A. SHAFFER
P. LINWOOD URBAN

LECTURER: GILMORE STOTT

VISITING LECTURER: GREGORY VLASTOS

The study of philosophy consists in examining the beliefs to which one is committed by accepting scientific knowledge and common-sense views of the world; clarifying basic concepts; determining the circumstances under which statements may properly be said to be true in all fields of human inquiry and concern, including ethical and aesthetic discourse; and drawing the outlines of an account of human experience coherent with the evidence of the sciences. Because of the role of philosophy in the history of human thought, and because of the relation of philosophical ideas to problems in other fields, philosophy may be studied as instrumental to the understanding of wider areas of history or thought.

Religion is studied primarily as a system of ideas, both ethical and theological: systematically, through a consideration of representative forms of contemporary religious thought; and historically, through an examination of the great religions and the development of religion, particularly of the Judaeo-Christian tradition.

REQUIREMENTS AND RECOMMENDATIONS FOR MAJORS AND MINORS

The minimum prerequisite to admission as a major in either philosophy or religion will normally be the completion of one year's work in the department. Students who major in philosophy must obtain permission in order to count for credit in fulfillment of their major requirement more than one course in religion; and students who major in religion must obtain permission in order to count for credit in fulfillment of their major requirement more than one course in philosophy. (Course 25 may be counted either as a course in philosophy or as a course in religion.) As supporting material for a major program in philosophy, the department recommends work in psychology.

1. INTRODUCTION TO PHILOSOPHY. The Staff.

Each Semester

Several of the most important problems of philosophy, and alternative answers to them, are discussed. Typical examples are: the problem of free will, the arguments for the existence of God, the nature of logic and mathematics, the sources and kinds of knowledge, the justification of ethical judgments.

† Absent on leave, spring semester, 1957-58.

3-4. PHILOSOPHICAL CLASSICS. Mr. Beardsley and Mr. Shaffer. *Full Course*

The major problems of philosophy are approached through study of some of the great philosophical literature of the West. Plato's *Republic*, Descartes' *Meditations*, and Hume's *Dialogues Concerning Natural Religion* will be read in their entirety; and selections will be read from Aristotle, Lucretius, Aquinas, Hobbes, Berkeley, Locke, J. S. Mill, and others. Students who take Course 1 may *not* elect Course 3-4.

NOTE: Either Course 1 or Course 3-4 is a prerequisite for any other course in philosophy. Other courses may be taken in any order that is convenient. Members of the department will offer advice on request concerning an order of courses to suit individual needs. Students planning to do honors work should not take courses dealing with material to be covered in honors seminars.

11. ETHICS. Mr. Stott. *Each Semester*

A study of the principal theories that have been offered about moral decisions and their justification. Attention is paid to systematic differences in types of theories, but the method of study consists of a critical reading of the works of leading ethical philosophers including Plato, Aristotle, Hume, Kant, and Bentham.

12. LOGIC. Mr. Beardsley. *Fall Semester*

An introduction to applied semantics and applied logic, both formal and inductive. The emphasis is on principles and distinctions that are useful in ordinary reading and writing.

13. SELECTED MODERN PHILOSOPHERS. Mr. Shaffer. *Spring Semester*

The history of modern philosophy, with primary attention given to the problem of the foundations, scope and limits of human knowledge, as examined by Descartes, Locke, Berkeley, Hume and Kant.

14. ANCIENT PHILOSOPHY. Mr. Shaffer and Mr. Vlastos. *Fall Semester*

A study of ancient philosophy in all its aspects: ethics, political theory, metaphysics, and aesthetics. Primary emphasis is placed on the dialogues of Plato; briefer attention is given to the pre-Socratics, Plato's contemporaries, and Aristotle.

15. PHILOSOPHY OF SCIENCE. Mr. Scriven. *Spring Semester*

A study of the nature, scope, and limitations of scientific method and scientific explanations. This involves, on the one hand, a treatment of a number of particular logical problems such as the nature of scientific laws, objectivity, probability, and theories; and, on the other hand, some treatment of a number of particular scientific topics such as the definition of life, action, at a distance, cosmology, the uncertainty principle, and relativity.

16. CONTEMPORARY PROBLEMS. Mr. Brandt and Mr. Shaffer. *Fall Semester*

A study of contemporary discussions of fundamental problems, such as the theory of meaning, the foundations of knowledge, the perception of physical objects, the nature of the self. Readings in the articles and books of major living philosophers, including Russell, Lewis, Ayer, and Ryle.

17. AESTHETICS. Mr. Beardsley. *Spring Semester*

A study of some problems that arise in describing and evaluating works of art. The course involves: (1) clarifying such basic terms of criticism as "form," "style," and "meaning"; (2) examining the principles and underlying assumptions of criticism; and (3) analyzing the nature of aesthetic value, especially the claim that works of art are "good," "beautiful," and "true."

18. SOCIAL PHILOSOPHY. Mr. Scriven. *Fall Semester*
 A survey of the philosophical problems arising from the study of the history and behavior of human societies. Some examples are: the possible limitations on prediction, the nature of historical and psychological explanations, the methodological role of value-judgments, the idea of the society as more than its members, historical relativism, the possibility and nature of empathy and understanding.
25. PHILOSOPHY OF RELIGION. Mr. Moore. *Spring Semester*
 The nature of religion; the psychology and interpretation of religious experience; the problem of religious knowledge; the validity and difficulties of Christian theology and ethics.
32. BIBLICAL RELIGION AND ETHICS. Mr. Moore. *Fall Semester*
 Important parts of the Old and New Testament are examined, in order to trace the growth of Hebrew and Christian religions and the development of the ideas of the Judaeo-Christian tradition, both ethical and theological.
33. EARLY CHRISTIAN THOUGHT. Mr. Urban. *Fall Semester*
 The rise and development of Christian thinking to the 13th century, the influence of Judaism and Greek philosophy, the formation of the creeds, Scholasticism, Augustine and Aquinas.
34. MODERN CHRISTIAN THOUGHT. Mr. Urban. *Spring Semester*
 The development of Christian thought from the Reformation to the twentieth century, with emphasis upon the relationship between Christian and secular thinking; the main ideas of the Reformation, church and sect in the Reformation, Roman Catholic development, Protestant orthodoxy, Protestant liberalism.
35. HISTORY OF RELIGIONS. Mr. Moore. *Fall Semester*
 An historical and comparative study of the world's religions: primitive religions, Hinduism, Buddhism, Chinese and Japanese religion, Islam. Stress will be placed upon the ethical and philosophical teaching of these religions and their role in the interaction of modern cultures. Comparisons and contrasts will be made between these religions and Judaism and Christianity.
36. PROBLEMS OF CHRISTIANITY TODAY. Mr. Urban. *Each Semester*
 The purpose of this course is to study various answers to the chief religious problems of the twentieth century. Problems include: the nature of the Bible, science and religion, the existence of God, religion and social problems, religion and education, the meaning of history. Answers include: fundamentalism, liberalism, humanism, Christian orthodoxy and neo-orthodoxy. The student will be urged to find his own answers and to work out his own religious beliefs.
37. RELIGIONS OF AMERICA. Mr. Urban. *Spring Semester*
 A study of some of the more important American religious groups with regard to their history, teaching and present status. Visits will be made to representative churches and synagogues.

HISTORY 61. QUAKERISM. Mr. Tolles.

The history of the Society of Friends to the present day. The characteristic religious and social ideas of the Quakers are considered in their historical setting. (May be counted toward a major in religion.)

HONORS WORK

For admission to honors in philosophy, the requirement is normally two semester courses drawn from those numbered from 1 to 25. For admission to honors work in religion, the requirement is normally two semester courses selected from among courses numbered 1, and 25 to 45.

101. MORAL PHILOSOPHY. Mr. Brandt.

The first part of the seminar is devoted to theories about the nature and justification of statements about values and obligation, including ethical relativism and relevant psychological and anthropological material. The latter part of the seminar concerns the tenability of theories like hedonism and utilitarianism, and problems such as economic justice, the theory of rewards and punishments, human rights, and the freedom of the will. Historical figures are discussed, but the emphasis is systematic.

102. ANCIENT PHILOSOPHY. Mr. Shaffer.

The development of Greek thought in ethics, metaphysics, logic and science, with special attention to Plato and Aristotle. Emphasis is given to tracing the emergence of distinctively philosophical and scientific methods, and the relation of these methods to contemporary techniques.

103. HISTORY OF MODERN PHILOSOPHY. Mr. Beardsley and Mr. Shaffer.

The development of modern thought from Descartes to Kant. This seminar may appropriately be combined with work in any of the three divisions.

104. CONTEMPORARY PROBLEMS. Mr. Brandt and Mr. Shaffer.

A study of contemporary theories on some basic problems such as the theory of meaning, universals, the foundations of knowledge, theories of perception, the nature of the self and mental states, and the relation of mind and body. The reading is in the recent work of such philosophers as Broad, Ayer, Russell, Lewis, Ryle, and Wittgenstein.

105. PHILOSOPHY OF SCIENCE. Mr. Scriven.

Spring Semester

An advanced treatment of some fundamental problems in the field, intended to develop a capacity for abstract analytical reasoning. Some of the topics are: the nature of scientific explanations, laws, and theories; the concepts of probability and meaningfulness; the thesis of determinism; definition and inference; the role of mathematics and models in science.

106. AESTHETICS. Mr. Beardsley.

A systematic examination of the philosophy of art and the methodological foundations of criticism. Recommended for students of literature, music and the fine arts.

107. SOCIAL PHILOSOPHY. Mr. Scriven.

Fall Semester

An advanced treatment of some problems arising from the study of societies and individuals, intended to develop the capacity for analytical reasoning in this field. Examples of topics: the nature of scientific method; the possibility and significance of distinctions between these studies and the physical sciences; the development and criticism of special concepts (e.g., "group," "progress," "insight," "welfare," "unconscious wish," "class warfare"); the descriptive-evaluative distinction; ideal types and ideal societies.

108. SYMBOLIC LOGIC. Mr. Scriven.

Spring Semester

The three aims of this seminar are (1) thorough coverage of the techniques of elementary and intermediate symbolic logic, and some attention to advanced topics; (2) development of the various views about the foundations of mathematics in the light of (1); (3) study of the logical implications and difficulties with (1) and (2) with reference to, e.g., the paradoxes, orders of infinity, extensions of the number concept, the Gödel and Skolem theorems.

109. THE THEORY OF VALUES.

An examination of the major problems concerning values, as they arise in the fields of philosophy, psychology, and anthropology. Literature representing the influential positions will be discussed. The emphasis will be on theoretical issues, especially the philosophical ones.

Not offered in 1957-58.

110. MEDIEVAL PHILOSOPHY. Mr. Urban.

Philosophical thought from Augustine to the fifteenth century. Attention will be paid both to specific problems such as universals, analogy, and epistemology and to outstanding thinkers such as Anselm, Aquinas, Scotus and Ockham. Although the primary emphasis will be historical, attention will be paid to the contemporary relevance of medieval thought.

111. THE IDEA OF GOD IN WESTERN THOUGHT. Mr. Urban.

An examination will be made of writings which have contributed most to Western concepts of God. The study will include Plato, Aristotle, the Bible, Athanasius, Augustine, Thomas Aquinas, Luther, Calvin, Kant, Schleiermacher, Rudolf Otto, C. S. Lewis and others.

112. MODERN RELIGIOUS PHILOSOPHERS. Mr. Urban.

This seminar will concentrate on representative religious thinkers or schools of thought in the present century. These will include Jacques Maritain, Anglo-Catholicism, Brunner, Liberalism, Reinhold Niebuhr, John Bennett, A. J. Muste, Paul Tillich and Will Herberg.

120. THESIS.

A thesis may be submitted by majors in the department in place of one of the seminars, upon application by the student and at the discretion of the Department.

Physical Education for Men

DIRECTOR OF ATHLETICS AND PHYSICAL EDUCATION FOR MEN AND ASSOCIATE PROFESSOR: WILLIS J. STETSON

ASSOCIATE PROFESSORS: ROBERT H. DUNN
LEWIS H. ELVERSON
EDWIN J. FAULKNER

ASSISTANTS: AVERY F. BLAKE
GOMER DAVIES
JOHN B. H. DONALDSON
RICHARD C. MADISON
JAMES J. MCADOO
JAMES H. MILLER

COLLEGE PHYSICIAN: DR. MORRIS A. BOWIE

The course in Men's Physical Education is designed to acquaint each participant with both team and individual sports. The value of team play is developed while emphasis is also placed on the so-called "carry over" sports which one can enjoy after graduation. Each individual, while benefiting from the physical exercise, also becomes better acquainted with the fundamentals, rules, etc., of the various sports and so is better able to enjoy these activities as a spectator.

The intercollegiate athletic program is a comprehensive one with varsity schedules in eleven different sports. In many of these activities there are contests arranged for junior varsity teams, thus providing ample opportunity for large numbers of men to engage in intercollegiate competition.

FACULTY REQUIREMENTS

Physical education is required of all non-veteran freshmen and sophomores unless excused by the College physician. During this two-year period, men students must attend a minimum of three classes per week.

All men not excused for medical or other reasons are expected to fulfill this requirement. A semester's work failed in the first two years must be repeated in the Junior year. No man with a deficiency in physical education will be permitted to enter his Senior year.

FALL ACTIVITIES

Badminton	Golf	Tennis
*Cross Country	*Soccer	Touch Football
*Football	Swimming	

WINTER ACTIVITIES

Badminton	Lacrosse	Track
*Basketball	*Swimming	Volley Ball
Boxing	Tennis	*Wrestling

SPRING ACTIVITIES

*Baseball	*Lacrosse	*Tennis
*Golf	Softball	*Track

* Indicates intercollegiate competition.

Physical Education for Women

ASSOCIATE PROFESSOR: VIRGINIA RATH, *Chairman*

ASSISTANT PROFESSORS: ELEANOR K. HESS

IRENE MOLL

MAY E. PARRY

ASSISTANT: NADIA CHILKOVSKY

COLLEGE PHYSICIAN: DR. MORRIS A. BOWIE

The aim of this Department is to contribute to the education of all women students through the medium of physical activity. We believe this contribution can best be achieved through participation in a broad program of recreational, rhythmic and developmental activities. Therefore the program provides: instruction and experience in sports and dancing; swimming ability for all; corrective and developmental exercises. It is our hope that the student will also acquire: appreciation of the dance as a fine art; the meaning of good sportsmanship; added endurance; good posture; leadership training; joy in outdoor exercise; and a program of interests and skills that will carry over for the individual and her community after college.

Classes are kept small to insure individual attention, and students are grouped according to ability. Ample opportunities are given for intramural and intercollegiate competition, as well as for public performances and demonstrations.

Freshmen and sophomores take three periods of activity each week. These may be elected from classes listed below with the stipulation that they take swimming until a test is passed; take a rhythmic activity; take a team sport; take Body Mechanics if the posture grade indicates a need for it.

Regulation costumes should be ordered before college opens. Blanks for this purpose will be sent out from the Office of the Dean to all incoming students.

SPORTS

- HOCKEY. Miss Parry, *Fall Term*
Class and Varsity.
- ARCHERY. Miss Rath. *Fall and Spring*
Class and Varsity.
- TENNIS. Miss Parry, Miss Rath, Mr. Faulkner, Miss Moll. *Fall, Winter and Spring*
Class and Varsity, Winter and Spring.
- GOLF. Miss Moll. *Fall and Spring*
Class and Varsity.
- SWIMMING. Miss Rath, Miss Parry. *Fall, Winter and Spring*
Beginner, intermediate and advanced classes in strokes and diving.
Class and Varsity.

BASKETBALL. Miss Moll, Miss Parry. *Winter*
Class and Varsity.

BADMINTON. Miss Parry, Miss Rath, Mr. Faulkner. *Winter*
Class and Varsity.

SOFT BALL. Miss Moll. *Spring*
Class and Varsity.

LACROSSE. *Spring*
Class and Varsity.

VOLLEY BALL. Miss Moll, Miss Parry. *Winter*
Class and Varsity.

DANCING. *Fall, Winter and Spring*
Class and Club.

FOLK AND SQUARE DANCING. Miss Moll. *Fall, Winter and Spring*
Open to men students also.

BODY MECHANICS. Miss Rath. *Winter*
Required of all first-year students whose posture indicates a need for it.

TUMBLING. Miss Rath. *Winter*

RECREATIONAL LEADERSHIP. Miss Moll, Miss Rath. *Winter and Spring*
Theory and practice teaching in recreational activities of all kinds. Given in alternate years.

RED CROSS LIFE SAVING. Miss Rath and members of Instructor Training Board. *Winter and Spring*
Senior and Instructors' courses.

Physics

PROFESSORS: WILLIAM C. ELMORE ‡, *Chairman*

MILAN W. GARRETT

ASSOCIATE PROFESSOR: DENNISON BANCROFT

INSTRUCTOR: DANIEL WILLARD

ASSISTANT: KENNETH L. LAWS

The physics department, through its introductory course in general physics, endeavors to give an integrated account of basic physics. In this course, as well as in the advanced work of the department, emphasis is placed on quantitative, analytical reasoning, as distinct from the mere acquisition of facts and skills. The introductory course makes no pretense of covering all material of interest to physicists, but rather comprises a selection of topics which form a coherent group.

Advanced work in the department involves a more intensive study of topics covered at the introductory level, and of many phases of modern physics which require a considerable background in mathematics and electricity. In all courses and seminars particular importance is attached to laboratory work, inasmuch as physics is primarily an experimental science.

REQUIREMENTS AND RECOMMENDATIONS FOR MAJORS AND MINORS

Students who intend to major in physics normally take Course 1, 2 in the freshman year and Course 11, 12 in the sophomore year. In addition they should complete Course 12 in mathematics and Course 2 in chemistry by the end of the sophomore year. In view of graduate school requirements, and of the extensive literature of physics in German, it is strongly recommended that the student fulfill his language requirement in German. A grade of C or better in Course 1, 2 is prerequisite for all further work in the department.

The work of the last two years normally involves an honors program, and includes three seminars in physics and three seminars in mathematics. Other seminars in the program are usually chosen from electrical engineering, chemistry, or philosophy. Such a program is a particularly satisfactory way of preparing for graduate or other professional work in physics or in mathematics. However, it constitutes in itself an effective educational program, since the aim throughout is to achieve an understanding of fundamental ideas and concepts, as distinct from the mastery of information, skills and techniques in a limited segment of science.

COURSE STATEMENT

1, 2. GENERAL PHYSICS. Staff.

Full Course

An introductory course in basic physics open to all students. No prerequisite other than those for college entrance is assumed. This course or its equivalent must precede any advanced courses or seminars in physics. It is required of most science majors. Three lectures, a conference and a laboratory period weekly. Separate credit given for each semester's work.

‡ Absent on leave, 1957-58.

11, 12. MECHANICS, HEAT AND SOUND.

The material for this course is drawn from the fields of mechanics, elasticity, wave motion, kinetic theory, thermodynamics, and statistical mechanics. Since extensive use is made of the calculus, a course in this subject must precede or be taken concurrently. This course is recommended for physics majors and should meet the needs of other students desiring a second course in physics. Three conference hours and one laboratory period weekly.

HONORS WORK

101. OPTICS, SPECTRA AND ATOMIC STRUCTURE. *Fall Semester*

This seminar covers those aspects of physics directly connected with light, radiation and atomic structure. Topics include geometrical optics, physical optics, spectroscopy, spectral series, X-rays, and elementary quantum theory. In so far as practicable all theoretical conclusions are directly supported by laboratory work. Prerequisite: Physics 1, 2 and Mathematics 11, 12.

102. ELECTRICITY AND MAGNETISM. Mr. Garrett. *Fall Semester*

Based primarily on Page and Adams' *Principles of Electricity* and Harnwell's *Principles of Electricity and Electromagnetism*. It covers static and dynamic electricity, magnetism and electromagnetism, with some electronics. The emphasis throughout is on fundamental analysis rather than application. The laboratory includes measurements in direct and alternating currents and in magnetism, together with some fundamental experiments in electronics. Mathematics seminars in advanced calculus and differential equations are normally prerequisite.

103. MODERN PHYSICS. Mr. Willard. *Spring Semester*

The topics covered in this seminar include electromagnetic theory of radiation, special relativity, wave mechanics, isotopes, nuclear physics and high-energy particle physics. The seminar discussions are accompanied by a full-day laboratory period each week. This seminar must be preceded by that in electricity and magnetism.

104. THEORETICAL PHYSICS. *Spring Semester*

A study of selected topics, mostly drawn from classical physics. Little duplication occurs of theoretical material covered in the other seminars offered by the department. Based for the most part on Page's *Introduction to Theoretical Physics*. Not accompanied by laboratory.

Prerequisites: Physics 11, 12 and Mathematics 101, 102. Not offered regularly.

Political Science

PROFESSOR: J. ROLAND PENNOCK, *Chairman*

ASSOCIATE PROFESSOR: KENNETH N. WALTZ

ASSISTANT PROFESSORS: CHARLES E. GILBERT
DAVID G. SMITH

INSTRUCTOR: GENE D. OVERSTREET

The aim of the Department of Political Science is to study, both in ideal and in reality, the place of the state in society and to contribute to an understanding of the purposes, organization, and operation of political institutions, domestic and international. For the beginning student, the Department offers an introduction to the nature of politics and to the problems of various political systems. For those who become majors or for others who take additional work in political science, courses are provided which will permit giving special attention to the areas of political theory, comparative government, government in the United States, and international political institutions.

REQUIREMENTS AND RECOMMENDATIONS FOR MAJORS

Course 1-2 is prerequisite to all other work in the department. Students who intend to major in political science should, preferably, take Course 1-2 in the freshman year and Course 11 in the sophomore year; however, Course 11 may be taken by sophomores concurrently with Course 2. Students who desire to concentrate on international affairs without taking the full International Relations Program referred to below may substitute Comparative Government (Political Science 15) or The Soviet System (Political Science 19) for Course 11. Majors are also advised to take Economics 1-2. Courses in Accounting and Statistics (Economics 3 and 4) and in American history are recommended. Political Theory, either in seminar or in course, is required of all majors; course majors should take Course 60.

PROGRAM IN INTERNATIONAL RELATIONS

Students who plan to enter upon a career in the field of international relations should include in their programs, during the first two years, the introductory courses in economics, history and political science and should complete the intermediate course in one or more modern languages.

Advanced courses selected from the groups listed below may be incorporated in the programs of students who do their major work in economics, history, political science, or a modern language.

Those students who wish to concentrate in international relations may take their Senior Comprehensive Examination in this field. Students preparing for this examination should take eight, nine, or ten half courses from among those listed below, including all of those listed in Group I, one or more in Group II, and one or more in Group III. The examination is administered by a committee appointed by the chairmen of the Departments of Economics, History, and Political Science, under the Chairmanship of the Department of Political Science.

GROUP I

Political Science 12—International Politics
Political Science 13—International Law and Organization
Political Science 57-58—American Foreign Policy
Economics 60—International Economics

GROUP II

History 11—The Other American Republics
History 14—Russia
History 62—The Near and Middle East

GROUP III

Political Science 15—Comparative Government
Political Science 19—The Soviet System
Political Science 20—Far Eastern Politics
Political Science 59—Modern Political Theory.

Students who plan to enter the honors program will find it possible to select a similar combination of courses and seminars in the field of international relations. In planning such programs, they should consult with the chairmen of their prospective major departments.

COURSES

1-2. INTRODUCTION TO POLITICAL SCIENCE. All members of the department.

Full Course

The foundations of politics—sociological, psychological, and economic; nature and development of political institutions; types of government. A study of examples of the major forms of government, followed by a more detailed study of the national government of the United States. Political Science 1-2 is open to all students and is prerequisite to all other courses offered by the department. Credit is not given for a single semester of this course.

11. PROBLEMS IN COMMUNITY GOVERNMENT. Mr. Gilbert. *Spring Semester*

Study of selected problems in community life and government, at both local and state levels. Includes topics such as centralization and home rule; governmental reorganization; corruption, bossism and reform; urban and rural planning and development. Emphasis is placed on field work and original research, using one of the nearby communities as a laboratory.

12. INTERNATIONAL POLITICS. Mr. Waltz. *Alternate Years, Fall Semester*

Approaches to the theory and practice of international politics such as those developed by liberals, pacifists, behavioralists, and socialists will be examined in some detail before considering the abiding and changing patterns of relations among states and the various factors that affect them.

Not offered in 1957-58.

13. INTERNATIONAL LAW AND ORGANIZATION. Mr. Waltz. *Alternate Years, Spring Semester*

The development of international law and organization, including a study of the major problems of international law and world government and of the structure, accomplishments and limitations of general and regional organizations.

Not offered in 1957-58.

15. COMPARATIVE GOVERNMENT. Mr. Smith. *Alternate Years, Fall Semester*

A critical study of selected political systems of Western and Eastern Europe.

19. THE SOVIET SYSTEM. Mr. Overstreet. *Spring Semester*
 (Also listed as Russian Studies 19.)
 The structure and operation of political institutions in the Soviet Union, in relation to their theoretical and historical background and their socio-economic setting; Soviet foreign relations and the international Communist movement.
20. FAR EASTERN POLITICS. Mr. Overstreet. *Fall Semester*
 Nationalism in Asia, with its traditionalist, Marxist, and liberal democratic elements; the contemporary political systems of China, Japan, and India; special features of political development in backward areas.
51. PUBLIC ADMINISTRATION. Mr. Gilbert. *Alternate Years, Fall Semester*
 An analysis of policy-making and administration in modern governments with illustrative material drawn chiefly from the national government of the United States and with particular reference to recent developments. Problems of administrative organization, conduct of regulatory and managerial activities, financial administration, personnel, public relations, administrative law, politics and administration.
 Open to juniors and seniors only, except by special arrangement.
52. AMERICAN CONSTITUTIONAL LAW. Mr. Gilbert or Mr. Pennock. *Fall Semester*
 The role of the Supreme Court in the American political system, viewed both historically and through analysis of leading cases. Areas of Constitutional development emphasized are: the nature and exercise of judicial review; federalism and the scope of national power; civil liberties.
 Open to sophomores and upperclassmen. Sophomores carrying five courses will be relieved of the term paper requirement.
53. AMERICAN PARTY POLITICS. Mr. Gilbert. *Alternate Years, Fall Semester*
 An historical and functional analysis of American political parties, including a study of interest groups, public opinion, electoral devices, political leaders, and proposals for the reorganization of the existing party structure.
 Not offered in 1957-58.
54. HISTORY OF POLITICAL THEORY. Mr. Smith. *Fall Semester*
 The development of thought on the nature of the state and of individual rights and duties, based largely on readings of the chief political philosophers from Plato to Rousseau. Topics studied include: Greek and Roman political thought; medieval universalism and the divine right of kings; the Reformation and the development of contractual theory; natural law and natural rights.
 Open to juniors and seniors only, except by special arrangement, and to sophomores planning to take the "Modern and Analytical" version of the Political Theory honors seminar.
55. AMERICAN POLITICAL THOUGHT. *Alternate Years, Spring Semester*
 A study of the development of American political thought: the colonial period; the Revolution; Jeffersonian Democracy; Jacksonian Democracy; the nature of the Union; newer currents, including the progressive movement, labor, and conflicts between church and state.
 Not offered in 1957-58.
56. JURISPRUDENCE. Mr. Pennock. *Spring Semester*
 A study of the sources and nature of law; historical, sociological and philosophic approaches to legal theory; the nature of the judicial process; key problems of jurisprudence illustrated by case study in selected areas of American constitutional law.

57-58. AMERICAN FOREIGN POLICY. Mr. Waltz. *Alternate Years, Full Course*

The problem of defining the objectives of American foreign policy and of selecting the means for achieving them; past, present and suggested American strategies in world politics; the influence of internal and external conditions on the making of foreign policy; the effects of our policies in crucial parts of the world.

59. MODERN POLITICAL THEORY. Mr. Smith. *Spring Semester*

Political theory from the Enlightenment to the present. Utilitarianism, Idealism, and Neo-idealism; anarchism, Marxism, and later socialist doctrines; monistic and pluralistic theories of sovereignty. Considerable time will be devoted to analysis of democratic and totalitarian theories, and to the political problems of democratic economic planning.

60. SPECIAL TOPICS IN POLITICAL SCIENCE. Mr. Smith. *Spring Semester*

This course, conducted in seminar fashion, is designed for senior majors. By means of papers and assigned readings it covers aspects of political science not elsewhere intensively developed and helps the students to integrate materials studied previously.

HONORS WORK

Prerequisite: Political Science 1-2. The following seminars prepare for examination for a degree with Honors:

101. (a) and (b). POLITICAL THEORY. Mr. Pennock or Mr. Smith. *Each Semester*

The nature of the state, the bases of political obligation, sovereignty and the nature of law, liberty, equality, rights, democracy, totalitarianism—all in the light of the theories set forth by writers on these subjects from Plato to the present. This seminar is given in two versions, one beginning with Plato and proceeding chronologically, and the other (designated "Modern and Analytical") starting with Machiavelli and organized in more topical fashion.

102. POLITICS AND LEGISLATION. Mr. Gilbert. *Spring Semester*

The study of political parties, interest groups, public opinion and voting behavior, electoral systems and representation, the legislative process. Emphasis is on American politics, with some comparative material; and, ultimately, on politics from the standpoint of theories of political democracy.

103. PROBLEMS IN GOVERNMENT AND ADMINISTRATION. Mr. Gilbert. *Fall Semester*

A detailed study of the forms and functions of modern government, particularly on the administrative side. Problems of administrative organization, policy-making and responsibility in the light of democratic political purposes and processes and the legal, sociological and economic setting. Emphasis is on United States experience, although relevant experience abroad is examined.

104. INTERNATIONAL POLITICS, LAW, AND ORGANIZATION. Mr. Waltz. *Fall Semester*

A comprehensive inquiry into the principles and problems of international politics, international law, and international organization.

105. AMERICAN FOREIGN POLICY. Mr. Waltz. *Spring Semester*

A study of key problems faced by the United States in the modern world together with a detailed, critical investigation of the making and implementing of American foreign policy. The changing assumptions of our policy and the political, economic and social influences upon it will be carefully considered.

106. PUBLIC LAW AND JURISPRUDENCE. Mr. Pennock. *Spring Semester*
Sources and nature of law; historical, sociological, philosophic, and "realistic" approaches to law; key problems of jurisprudence illustrated by study of the fields of federalism and civil liberties in American constitutional law.
107. THE SOVIET SYSTEM. Mr. Overstreet.
A study of political, social, and economic institutions in the Soviet Union in relation to their theoretical and historical background; Soviet foreign relations and the international Communist movement.
108. COMPARATIVE GOVERNMENT. Mr. Smith.
Advanced study of comparative government; governmental structures and political processes largely as exemplified by selected governments of Western and Eastern Europe; inquiries into common problems, such as planning, defense, nationalization, and trans-national political movements.
120. THESIS. All members of the department.
Approval must be secured early in the student's junior year.

Psychology and Education

PROFESSORS: SOLOMON E. ASCH

WOLFGANG KÖHLER, *Research Professor Emeritus of Philosophy and Psychology* (on special research grant).

WILLIAM C. H. PRENTICE

JOSEPH B. SHANE

HANS WALLACH, *Chairman*

ASSOCIATE PROFESSOR: HENRY GLEITMAN

ASSISTANT PROFESSORS: GLORIA L. CAREY

PETER MADISON

INSTRUCTOR: JACOB NACHMIAS

LECTURER: ALICE K. BRODHEAD

The work of the Department of Psychology deals with the scientific study of human behavior and experience: the basic processes of perception, learning, thinking and motivation, and consideration of their relation to development of the individual personality; and the social relations of the individual to other persons and to groups. For those students planning for graduate and professional work in psychology the courses and seminars of the department are designed to provide a sound basis of understanding of psychological principles and a grasp of research method. Other students learn the nature of psychological inquiry and the psychological approach to various problems encountered in the humanities, the social sciences and the life sciences.

REQUIREMENTS AND RECOMMENDATIONS

Introductory Psychology is required of all students who wish to take other courses in the department. Students who wish to take Honors Seminars may offer Psychology 1 and any other half-course as evidence of their competence (including those numbered from 50 to 59). Honors majors will be required to offer Psychology 4 (Elementary Experimental Psychology). Students who wish to major in course should take Psychology 1 and any other half-course. Psychology 4 is required of all course majors, but they need not take it during their sophomore year.

Courses in education—11, 12, 13, 14, 15 and 16 will not be credited toward a major in psychology. Education alone may not be elected as a major subject, and not more than two full courses in education will be accepted for credit toward the bachelor's degree.

Swarthmore students may fulfill the Pennsylvania requirements for the certification of secondary school teachers by taking:

1. Psychology 1—Introductory Psychology.
2. Education 11—Educational Psychology.

3. Education 14—Introduction to Teaching.
4. Two courses to be chosen from among:
 - a. Education 12—Principles of Secondary Education.
 - b. Education 13—Methods of Secondary Education.
 - c. Education 15—History of Education.
5. History 4, 5, 4x, or 5x—The United States (arrangements must be made for special work in the History of Pennsylvania). Only one term is required.
6. A minimum of three full courses (or six half-courses) in the subject or field in which the student expects to teach.
7. Education 16—Practice Teaching.

Swarthmore students may receive credit toward a Pennsylvania elementary school certificate by taking:

1. Psychology 1—Introductory Psychology.
3. Psychology 16—Child Psychology.
4. Education 11—Educational Psychology.
5. Education 14—Introduction to Teaching.
6. History 4, 5, 4x, or 5x—The United States (with special work in Pennsylvania history). Only one term is required.

Psychology

1. **INTRODUCTORY PSYCHOLOGY.** Mr. Gleitman. *Each Semester*
Three lectures plus weekly conference hour to be arranged. A survey of the problems studied by psychologists and of the facts and theories of modern behavior study. Chief emphasis is given to basic contributions in perception, learning, thinking, and motivation.
4. **ELEMENTARY EXPERIMENTAL PSYCHOLOGY.** Mr. Wallach and Staff. *Each Semester*
Laboratory section one afternoon per week to be arranged. An introduction to experimental thinking and laboratory techniques in psychology.
5. **ANIMAL EXPERIMENTATION.** Mr. Gleitman. Offered irregularly on request. Students desiring to exercise this option should consult with the Staff at least one semester in advance.
6. **LABORATORY IN PERSONALITY STUDY.** Mr. Madison. *Spring Semester*
An introduction to the problems and concepts of personality and motivation through intensive study of individual students. Two hours of lecture and a four-hour laboratory.
52. **MOTIVATION.** Mr. Nachmias. *Spring Semester*
Emphasis is upon the role of dynamic factors (drives, needs, values) in the determination of behavior. Consideration is given to the measurement of motives, the relationship between biological and psychological tension-systems, conflict, frustration, success and failure, reward and punishment. Evaluation of the theories of motivation of McDougall, Tolman, Lewin, Allport, Murray and Freud. Term paper or design of an original experiment is required.
54. **LEARNING AND THINKING.** Mr. Gleitman, Mr. Nachmias. *Fall Semester*
An advanced course in problems, facts, and theories about man's creative thought, problem-solving, and memory. Some use will also be made of animal evidence and of current systematic approaches.

55. CHILD PSYCHOLOGY. Mr. Madison.

Fall Semester

The development of the child from birth through puberty, studied in terms of basic psychological principles. Important theories and practices of child-rearing are evaluated in the light of experimental and cross-cultural data. Topics include the significance of infantile and childhood experience on subsequent personality development, parent-child relationships, sibling rivalry, and the "behavior problems" which typically occur during the socialization process. One of the following is required: (1) acting as an assistant in a child-care center for approximately 20 hours, (2) an intensive study of a single child.

56. SOCIAL PSYCHOLOGY. Mr. Asch, Miss Carey.

Fall Semester

A study of some basic processes and products of interaction between persons and groups and between groups. The following topics are covered: the formation of the social field of the individual. Perception of persons as psychological entities. Perception of groups. Formation of the self; social relations of the self. Psychological forces supporting group-belonging. Functional consequences of group membership. The psychological investigation of group processes. Group requirements and group standards. Formation and change of attitudes.

57. PSYCHOLOGICAL TESTS AND MEASUREMENTS. Mr. Madison.

Alternate years

The concept of psychological measurements as applied to tests of intelligence, personality, interests, and abilities. The course surveys a wide variety of contemporary tests and studies intensively the characteristics and underlying assumptions of one representative test of each major type.

58. PERSONALITY. Mr. Madison.

Fall Semester

Contemporary thought on the personality concept, considered broadly as the individual's characteristic representation of and reaction to events of emotional significance in living. The adjustive, motivational and cognitive aspects of personality. Topics such as the nature of our phenomenal experience of self and of personality, the concepts of unrecognized and unconscious processes, personality types, and the characteristics of good and poor adjustment. The general problems of the origin, development and persistence of personality habits and the conditions under which change is possible. Particular interest in psychoanalytic and cognitive theory.

59. STATISTICS FOR PSYCHOLOGY AND EDUCATION.

An elementary survey of the principles and concepts of sampling, the techniques of describing data in quantitative terms, and certain notions of probability and inference. Measures of central tendency and dispersion; correlation; significance of differences.

60. PHYSIOLOGICAL PSYCHOLOGY.

The physiological foundations of human and animal behavior, including sensory function, metabolic and endocrine functions, the nervous system, and response mechanisms; the application of such facts to motives and appetites, to emotion, to perceiving, and to learning and thinking.

Not offered in 1957-58.

63-64. SYSTEMATIC SEMINAR. The Staff.

Full Course. Spring Semester

A double credit course requiring half the student's time for a semester. This seminar covers the major integrative theories or approaches to psychology, including structuralism, functionalism, behaviorism, Gestalttheorie, and psychoanalysis. Majors students who so elect will take Course 63-64 in their senior year. The course is open only to senior psychology majors except by special arrangement.

The following courses are not to be counted toward a major in psychology and are not included in the comprehensive examination; they are designed primarily for students whose major work is in other departments.

41. **THE PSYCHOLOGY OF DRAMATIC EXPERIENCE AND PRESENTATION.** Mr. Gleitman.
The object of this course is to explore some possible contributions of scientific psychology—in particular, the psychology of emotional expression—to an area hitherto the domain only of intuitive artists. Topics of discussion will include structural aspects of dramatic forms, the experience of the comic and the tragic, psychological problems of timing and rhythm, theories of acting and direction, and the like. The course will involve some laboratory work, testing relevant hypotheses with standard experimental techniques. Permission of instructor is necessary.

Prerequisite, Psychology 1. Some contact with drama either through the literature or in practice is desirable.

Three hours lecture per week and 2 hours laboratory.

Not offered in 1957-58.

42. **APPLIED SOCIAL PSYCHOLOGY.**

This course deals with communications within groups, leadership, attitudes and propaganda, wage payment plans, consumer motivation and behavior, and the structure of organizations. Attention will be given to the application of concepts that have been drawn from the laboratory study of motivation, perception, and learning.

Not offered in 1957-58.

43. **EMOTIONAL AND MOTIVATIONAL PROCESSES.** Mr. Asch, Mr. Hunt, and Dr. Saul.
Spring Semester.

The role of emotions and motives in the process of reaching maturity. In addition to readings in the general literature, a number of case histories will be studied. To increase the student's insight into the difficulties and possibilities of emotional growth.

Education

11. **EDUCATIONAL PSYCHOLOGY.** *Spring Semester*

The application of psychological principles concerned with the processes of thinking, learning and motivation to the problems of education.

Prerequisite: Course 1.

12. **PRINCIPLES OF SECONDARY EDUCATION.** Mr. Shane. *Fall Semester*

A study of the principles of secondary education, with emphasis upon aims and organization. Visits to nearby schools are made.

13. **METHODS OF SECONDARY EDUCATION.** Mr. Shane. *Fall Semester*

A review and critical analysis of the methods used in secondary education.

14. **INTRODUCTION TO TEACHING.** Mrs. Brodhead. *Each Semester*

Current educational theory and practice. Weekly seminar plus three hours a week assisting in a classroom in the local schools.

15. **HISTORY OF EDUCATION.** Mrs. Brodhead. *Each Semester*

Educational thought in our western culture from the Greeks to the present day. Weekly seminar.

16. **PRACTICE TEACHING.** Mrs. Brodhead.

A limited number of students may complete the Pennsylvania requirement of 180 hours in the Swarthmore High School summer session under the direction of their teaching staff. Students should enroll for this course at the January registration.

HONORS SEMINARS

101. PERCEPTION. Mr. Wallach, Mr. Prentice.
Reading and discussion combined with independent experimental projects. The student is expected to know the basic facts about human perceptual mechanisms, particularly visual ones, by the time he has completed this seminar. Specific topics covered are: color vision, grouping and form, depth and distance, size, movement, influences of learning and of needs of attitudes, general theory of perception. When time permits, some attention is given to parallel problems in other senses.
102. LEARNING AND THINKING. Mr. Gleitman, Mr. Nachmias.
Deals with principles of adaptive behavior, the functions of memory and thinking; the nature of understanding and problem-solving; the nature of intelligence.
103. MOTIVATION. Mr. Prentice, Mr. Nachmias.
A systematic and experimental approach to the dynamics of behavior, based on material drawn from the laboratory and the clinic, and covering the following topics: instinctive behavior and biological drives; the relation of motivation and learning; derived motivation; the relation of perception and motivation; frustration and its relation to aggression, regression; level of aspiration; success and failure; substitution and sublimation; ego needs and the nature of the ego; emotion and feeling; contemporary theories of motivation.
104. INDIVIDUAL IN SOCIETY. Mr. Asch, Miss Carey.
The relationship between man and his society, approached from the points of view of social psychology, sociology, and cultural anthropology; the study of group-structures and the psychological consequences of group-membership; the critique of available procedures for scientific treatment of group-behavior and group-influences.
105. PERSONALITY. Mr. Madison, Miss Carey.
The personality concept, considered broadly as the individual's characteristic representation of and reaction to events of emotional significance in living. Principal attention to the origin of contemporary thought on personality in Freud's writings and the relation of his concepts to general theory in psychology. Topics such as the adjustive, motivational and cognitive aspects of personality, the nature of our phenomenal experience of self and of personality, the concepts of unrecognized and unconscious processes, personality types, the characteristics of good and poor adjustment, and methods of personality study. Problems of the origin, persistence and change of personality habits as these are understood in personality theory on the one hand and in the psychology of learning and perception on the other. Laboratory work in the study of problems in personality when conditions permit.
106. DEVELOPMENT. Mr. Prentice, Mr. Gleitman.
An investigation of the concepts of psychological growth, including sensori-motor skill, intellectual and emotional functions, and personality. Readings in experimental and clinical literature; some direct observation and experimentation with children.
120. THESIS. All members of the department.
May be presented as a substitute for one seminar, provided the student is doing major work in psychology with four seminars, and provided some member of the department is available to undertake the direction of the thesis,

MASTER'S DEGREE

A limited number of students may be accepted for graduate study toward the Master's degree in psychology. Students receiving the Bachelor's degree from Swarthmore are not normally eligible for this work.

The program of work for the Master's degree requires the completion of four seminars, or their equivalent. One of the seminars must be a research seminar leading to a Thesis. The work of the seminars is judged by external examiners. The requirements for the Master's degree can normally be completed in one year.

Russian Studies

A grant from the Carnegie Corporation made possible the inauguration of a Russian Studies program, in the fall of 1949, at Bryn Mawr, Haverford, and Swarthmore Colleges. While that grant has now expired, Swarthmore College continues to offer courses in Russian language, history, and political and social institutions.

Courses in this group cannot themselves comprise a major subject. Courses in the Russian language may be used to fulfill the college foreign language requirement. Courses and seminars in Russian history and in Russian political and economic institutions may be counted toward a major or minor in the departments offering them. (These courses are listed under their appropriate departments.)

RUSSIAN LANGUAGE

- 1-2. **ELEMENTARY RUSSIAN.** *Full Course*
Vocabulary and grammar. Oral and written translations from English into Russian and vice versa. Vocabulary building. Reading of short stories. Books: *Essentials of Russian* (Prentice-Hall), *Stories by Lermontoff and Pushkin* (Heath series). Five hours a week.
- 3, 4. **INTERMEDIATE RUSSIAN.**
Review of grammar with special emphasis on use of prepositions, verb forms, numerals. Short area study, geography and history of Russia to the revolution of 1917. Advanced reading and composition. Books: *Essentials of Russian* (Prentice-Hall), *Russian Area Reader* (Ronald Press).

HISTORY

14. **RUSSIA.** Mr. Beik. *Fall Semester*
The history of modern Russia. For sophomores, juniors and seniors. The course begins with the reign of Peter and gives half its time to the period since the Revolution. It may be taken only after History 1-2.
117. **EUROPE 1870 TO 1939: EASTERN EUROPE.** Mr. Beik. *Honors Seminar*
The origins and consequences of the Russian Revolution and of the formation of the succession states.

POLITICAL AND ECONOMIC INSTITUTIONS

19. **THE SOVIET SYSTEM.** Mr. Overstreet. *Spring Semester*
The structure and operation of political institutions in the Soviet Union, in relation to their theoretical and historical background and their socio-economic setting; Soviet foreign relations and the international Communist movement.
107. **THE SOVIET SYSTEM.** Mr. Overstreet. *Honors Seminar*
A study of political, social, and economic institutions in the Soviet Union in relation to their theoretical and historical background; Soviet foreign relations and the international Communist movement.



Section 1

Faint, illegible text in the first section, possibly describing a process or procedure.

Section 2

Faint, illegible text in the second section, continuing the description or procedure.

Section 3

Faint, illegible text in the third section, providing further details.

Section 4

Faint, illegible text in the fourth section, concluding the document.

REFERENCE SECTION

Visiting Examiners—May 1957

- ASTRONOMY:** PROFESSOR LOUIS C. GREEN, *Haverford College*; PROFESSOR FRANKLIN B. WOOD, *University of Pennsylvania*.
- BIOLOGY:** PROFESSOR HANS G. BOREI, *University of Pennsylvania*; PROFESSOR A. DUNCAN CHIQUOINE, *Princeton University*; PROFESSOR WILLIAM B. KINTER, *Harvard Medical School*; PROFESSOR RICHARD P. KORF, *Cornell University*; PROFESSOR MELVIN SANTER, *Haverford College*; PROFESSOR ADRIAN M. SRB, *Cornell University*; PROFESSOR JAMES F. SUTCLIFFE, *Kings College, University, of London*.
- CHEMISTRY:** PROFESSOR FREDERICK V. BRUTCHER, JR., *University of Pennsylvania*; PROFESSOR LOCKHART B. ROGERS, *Mass. Institute of Technology*; PROFESSOR EMIL J. SLOWINSKI, *University of Connecticut*.
- CLASSICS:** PROFESSOR MICHAEL H. JAMESON, *University of Pennsylvania*.
- ECONOMICS:** PROFESSOR ROBERT R. FRANCE, *University of Rochester*; PROFESSOR ROMNEY ROBINSON, *Brandeis University*; PROFESSOR ROBERT SOLOW, *Mass. Institute of Technology*.
- CIVIL ENGINEERING:** PROFESSOR FERDINAND P. BEER, *Lehigh University*
- ELECTRICAL ENGINEERING:** PROFESSOR RAYMOND S. BERKOWITZ, *University of Pennsylvania*; PROFESSOR WILLIAM H. SURBER, *Princeton University*.
- MECHANICAL ENGINEERING:** PROFESSOR JERRY GREY, *Princeton University*.
- ENGLISH LITERATURE:** PROFESSOR CHARLES T. DAVIS, *Princeton University*; PROFESSOR LEONARD F. DEAN, *University of Connecticut*; PROFESSOR GEORGE GIBIAN, *Smith College*; PROFESSOR DOROTHY VAN GHENT, *University of Vermont*; PROFESSOR EUGENE M. WAITH, *Yale University*.
- FINE ARTS:** PROFESSOR ALAN GOWANS, *University of Delaware*; PROFESSOR LINCOLN F. JOHNSON, *Goucher College*.
- HISTORY:** PROFESSOR JOHN B. CHRISTOPHER, *University of Rochester*; PROFESSOR GEORGE B. COOPER, *Trinity College*; PROFESSOR ARTHUR P. DUDDEN, *Bryn Mawr College*; PROFESSOR FELIX GILBERT, *Harvard University*.
- MATHEMATICS:** PROFESSOR ROBERT C. JAMES, *Haverford College*; PROFESSOR WILLIAM H. MILLS, *Yale University*.
- MODERN LANGUAGES:** *French*—PROFESSOR GERMAINE BRÉE, *New York University*; PROFESSOR WILLIAM ROACH, *University of Pennsylvania*. *Linguistics*—PROFESSOR HENRY M. HOENIGSWALD, *University of Pennsylvania*. *Russian*—PROFESSOR WILLIAM E. HARKINS, *Columbia University*.
- PHILOSOPHY AND RELIGION:** PROFESSOR MAX BLACK, *Cornell University*; PROFESSOR RODERICK FIRTH, *Harvard University*; PROFESSOR JOHN HOSPERS, *Brooklyn College*; PROFESSOR GEDDES MACGREGOR, *Bryn Mawr College*.
- PHYSICS:** PROFESSOR RICHARD B. SETLOW, *Yale University*.
- POLITICAL SCIENCE:** PROFESSOR GEORGE A. LANYI, *Oberlin College*; PROFESSOR EARL LATHAM, *Amherst College*; PROFESSOR FREDERICK WATKINS, *Yale University*.
- PSYCHOLOGY:** PROFESSOR JEROME S. BRUNER, *Harvard University*; PROFESSOR CALVIN S. HALL, *Western Reserve University*; PROFESSOR MARY HENLE, *New School for Social Research*; PROFESSOR ELIOT STELLAR, *University of Pennsylvania*.

Degrees Conferred

June 10, 1957

BACHELOR OF ARTS

In the Division of the Humanities

- | | |
|---|--|
| TERRY BARBEE ARMSTRONG (Psychology) | DOROTHY ELIZABETH FULLER (Philosophy) |
| DANIEL LOUIS AUBRY (History) | CAROLYN JOAN GAISER (English Literature) |
| JULIA BATTIN (Fine Arts) | SARA HELEN GIDDINGS (English Literature) |
| BARBARA ANN BEHNKE (English Literature) | NANCY ANN GOOLSBY (Fine Arts) |
| LOIS MAY BENNETT (English Literature) | DEBORAH HELEN GROSS (Fine Arts) |
| PATRICIA NIELD BLAKE (Fine Arts) | FERRIS MINOR HALL (History) |
| SHEILA BRODY (Philosophy) | JOAN WARREN HALL (History) |
| LYNDALL ELIZABETH CADBURY (English Literature) | JEAN MARILYN HAUGHT (Fine Arts) |
| EDWARD CAPPS, 3RD (Greek) | SHERRY OSMOND HESSLER (History) |
| JEAN STEVENS CARTER (English Literature) | CATHERINE MURDOCH JAMES (English Literature) |
| ELIZABETH ANN CHARLES (History) | FLORA JOHNSON-MULLER (French) |
| ROBIN HAMER CHRISTENSON (History) | PHYLLIS KLOCK (English Literature) |
| JOANNA MACDONALD CLARKE (History) | NORTON B. KNOPF (Psychology) |
| DAVID MCDOWELL CLAY (Philosophy) | JOAN MARY LOFTUS (English Literature) |
| SARA ELIZABETH COXE (Psychology) | PENELOPE EVELYN MASON (English Literature) |
| VICTORIA STEPHANIE CRANE (French) | HELEN M. MCCLAREN (English Literature) |
| NICOLE TISSOT CROSBY (French) | DONALD LEE MCGRADY (Spanish) |
| CATHLIN DAVIS (English Literature) | MINNA HELEN NEWMAN (Fine Arts) |
| BARBARA JANE DEATON (English Literature) | ELLANOR KENNEY PEISER (Religion) |
| MICHAEL ALEXIUS DE LASZLO (English Literature) | JANE RASKIN (History) |
| LAUDIE E. DIMMETTE (History) | ELIZABETH WOOD RITTENHOUSE (History) |
| HARRY FILMORE DOWLING, JR. (English Literature) | MARY MARKLEY ROBERTS (History) |
| JAMES CHATHAM DUANE (English Literature) | *JOHN DAVID ROSEN (English Literature) |
| CAROL CHARNA EDELSTEIN (English Literature) | LOUIS EMILE ROWLEY (History) |
| RUTH ELLENBOGEN (Fine Arts) | RUSSELL RYAN (Philosophy) |
| PHILIP ASHLEY FANNING (Philosophy) | MARY LUPTON SCHENCK (Fine Arts) |
| BARBARA ANN FASSETT (Fine Arts) | JOHANN PETER SCHICKELE (Music) |
| JANE ABBY FLAX (English Literature) | NANCY SHERRY (History) |
| FELICIA FORSYTHE (Psychology) | STUART JOEL SILVERS (History) |
| BETTINA FRENCH (English Literature) | CHARLES THOMPSON SMITH (History) |
| MARY L. FRORER (Religion) | DEBORAH BURKE SMITH (English Literature) |

URSULA M. M. SOMMER (German)
SUSANNA DAY SPIER (English Literature)
ANN BAILEY STODDARD (History)
RONALD EUGENE SUTTON (English Literature)
DANA WESTBROOK SWAN, 2ND (History)

BARBARA ELIZABETH SWARTHOUT (History)
SUSAN ELIZABETH SWIFT (History)
BARBARA ELLEN TRACY (Fine Arts)
CATLIN KENNEDY WARTHIN (History)
ELIZABETH ANN WILSON (History)
ELEANOR HOYT WITTE (English Literature)

In the Division of the Social Sciences

KATHERINE MATTHEWS APPLIGATE (Economics)
*RONALD N. AXE (Economics)
SIGMUND AUSTIN BECK (History)
DANIEL L. BELL (Economics)
DAVID ALEXANDER BENNAHUM (History)
CLEMENT BIDDLE (Economics)
RONALD GEORGE BODKIN (Economics)
HAIG JOHN BOYADJIAN (Political Science—International Relations)
MARY HUGHES BOYCE (History)
ELLEN MARY BRAUNSTEIN (History)
JOHN THOMAS BROWNE (Economics)
BEVERLY JANE BRUHN (Political Science)
MARGARET HAMILTON CALMAR (Political Science)
JEAN BEVERLY CAMPER (History)
KAREN CHRISTIANSON (Economics)
PHILIP CROSS COOPER (Political Science—International Relations)
PHILIP ORVAL DEPUTY (Psychology)
CAROL ANN DUBIVSKY (Political Science—International Relations)
JEAN LOWRY EDEN (Religion)
WILLIAM DAVID FOULKES (Psychology)
LILLIAN ANN FRANK (Political Science)
WILLIAM ALEXANDER FROHLICH (History)
BARBARA LUCILLE GALLAGHER (Political Science)
OLIVIA JEAN GEYER (Economics)
*KENNETH EUGENE GILES (Economics)

SAMUEL LINTON HAYES, 3RD (Political Science—International Relations)
WILLIAM MOTT HICKS, JR. (History)
MARILYN KAYE IVERSON (Political Science—International Relations)
BARBARA SUSAN JACOBS (Political Science—International Relations)
*ROBERT DOUGLAS JONES (Political Science—International Relations)
ISAM KHAIRY KABBANI (Political Science—International Relations)
WILLIAM OWEN KAFES (History)
NANCY ANN KALTREIDER (History)
RUTH FINESINGER KELLAM (Psychology)
WHARTON RONALD KRESGE (Political Science—International Relations)
BEREND W. KROON (Economics)
GEORGE STEPHEN LLOYD (Political Science)
JEANETTE MACDONALD LUST (Political Science)
HARRIET EDITH MANGRUM (Political Science)
ANN LOUISE MAPLES (History)
MAXINE JOYCE MARCUS (Psychology)
*CHRISTIAN ENGLE MCMURTRIE (Political Science)
ANOUH MIRIDJANIAN (History)
MARY JANE MOODY (Political Science)
SUSAN PARKER NASON (Political Science)
PATRICIA ANNE NILES (Psychology)

* As of the Class of 1956

JON ALVAH PETERSON (History)
 CHARLES M. PHILLIPS (Psychology)
 STEPHEN HENDERSON PITKIN (Political
 Science)
 MARY MARTHA PORTER (Political Sci-
 ence)
 JEAN MARY POTTER (History—Interna-
 tional Relations)
 PETER SHAMBAUGH ROSI (History)
 JOHN A. ROWE (History)
 STEPHEN BARRY RUBIN (Economics)

TEKLA ALIDE SCHNORE (History)
 MICHAEL EDWARD SCHOEMAN (His-
 tory)
 JANET ALICE SENFT (History)
 HARRY STEVENSON TODD (Economics)
 CHINWUBA SYLVESTER UMEADI (Eco-
 nomics)
 STEPHEN BROUGHER WATKINS (Polit-
 ical Science)
 JAMES HOLLIWAY WHITE (Economics)

In the Division of Mathematics and the Natural Sciences

DOROTHEA LOUISE BORGMANN (Zool-
 ogy)
 PRISCILLA ANN BOSTON (Mathematics)
 SHEILA VALENTINE BROWN (Mathe-
 matics)
 ROBERT DAVID CAHN (Zoology)
 NANCY FROST CASE (Biology)
 DOROTHY NORRIS CHILLRUD (Biology)
 ARTHUR MICHAEL CONNING (Mathe-
 matics)
 MICHAEL HENRY COOPERSMITH (Phys-
 ics)
 MAYER BENSON DAVIDSON (Chemistry)
 JAMES ALDEN DEYRUP (Chemistry)
 CORA ANN DIAMOND (Mathematics)
 MARIANNE RUTH DURAND (Biology)
 CLIFFORD EARLE, JR. (Physics)
 ROBERT DUDLEY FISHER (Zoology)
 JAMES MEARNES GIBSON (Chemistry)
 PRISCILLA ANN GILMAN (Zoology)
 SARI ANN GINSBURG (Mathematics)
 LOIS ANNE GLASS (Biology)
 NEIL GRABOIS (Mathematics)
 SAMUEL JEROME HA (Zoology)
 NATALIA S. HARKAWAY (Chemistry)
 GEORGE KUTCHES HUNTINGTON (Zool-
 ogy)
 FRANCE MARSHALL JAMES, 3RD (Zool-
 ogy)
 *FRANCE IDA JULIARD (Biology)
 MARTIN PETER JURKAT (Mathematics)

ARTHUR KARLIN (Mathematics)
 STEPHEN HALL KING (Zoology)
 EUGENE L. LEBOY (Physics)
 MARY ELIZABETH LEWIS (Biology)
 GEORGE MATULA (Chemistry)
 VANETTA ELIZABETH MCFEELY (Biol-
 ogy)
 GILLES REZA GEORGES MONIF (Zool-
 ogy)
 PAUL HENRY MONSKY (Physics)
 MARGARET WALLACE MUNCHMEYER
 (Chemistry)
 VASKEN PARAGAMIAN (Chemistry)
 GORDON GILBERT POWERS, JR. (Zool-
 ogy)
 JUDITH MARTHA SHIMANSKY PREWITT
 (Mathematics)
 WILLIAM I. ROSENBLUM (Psychology)
 PETER ANTHONY SIMKIN (Zoology)
 DAVID HALLOCK SMITH (Mathematics)
 DAVID ROSS SONNEBORN (Zoology)
 MARY MILES SPILLER (Biology)
 JANICE ELLEN STAHL (Biology)
 PHOEBE STARFIELD (Zoology)
 JOHN GORDON STARR (Zoology)
 RORERT CHANDLER STEVER (Zoology)
 JEREMY J. STONE (Mathematics)
 DOROTHY MARIA EDITH WINTER
 (Mathematics)
 BETTY JANE YANNET (Mathematics)
 MATTHEW ZUCKER (Chemistry)

* As of the Class of 1956.

BACHELOR OF SCIENCE

In the Division of Engineering

LEWIS WESLEY ARGO (Mechanical Engineering)	ROBERT WILLIAM McMINN (Mechanical Engineering)
GEORGE O'BRYAN BAILEY, JR. (Mechanical Engineering)	CHARLES JOSEPH ODENWELLER, JR. (Electrical Engineering)
HUGH F. COYLE, JR. (Mechanical Engineering)	WILLIAM HARRY PERLOFF, JR. (Civil Engineering)
SAMUEL WINN CRISWELL (Electrical Engineering)	WELLES KNOWLES REYMOND (Electrical Engineering)
ROBERT WALTER ELLIS (Mechanical Engineering)	WILLIAM CARTER REYNOLDS (Mechanical Engineering)
RICHARD LEWIS FUSSELL (Electrical Engineering)	RALPH CLAYTON ROSSER, JR. (Civil Engineering)
EUGENE GERTLER (Electrical Engineering)	EBEN H. SALES (Civil Engineering)
THOMAS KEITH GLENNAN, JR. (Electrical Engineering)	BENJAMIN BRENNEMAN SNAVELY (Electrical Engineering)
DAVID S. HARVEY (Electrical Engineering)	*ROBERT JAMES STONE (Civil Engineering)
RONALD MARSH HEACOCK (Electrical Engineering)	DAVID PURNELL TICE (Electrical Engineering)
RICHARD W. HEWARD, JR. (Civil Engineering)	ROGER ALLEN WITT (Mechanical Engineering)
CHARLES JOSLIN HURST (Mechanical Engineering)	STEPHEN S. WOLFF (Electrical Engineering)
ROBERT LEAVITT (Civil Engineering)	WILLIAM ROBERT YOUNG (Electrical Engineering)
THOMAS OWEN MAHER (Civil Engineering)	

MASTER OF ARTS

**JOHN CAMERON HAY Psychology

DOCTOR OF SCIENCE

HENRY JERMAIN MAUDE CREIGHTON

DOCTOR OF LAWS

CLEMENT MILLER BIDDLE, SR.
GEOFFREY CROWTHER

MARION BAYARD FOLSOM
BLISS FORBUSH

* As of the Class of 1956.

** As of June, 1956.

Awards and Distinctions

June 10, 1957

HONORS AWARDED BY THE VISITING EXAMINERS

HONORS:

Julia Battin, David Alexander Bennahum, Dorothea Louise Borgmann, Sheila Valentine Brown, Lyndall Elizabeth Cadbury, Jean Beverly Camper, Edward Capps, 3rd, Robin Hamer Christenson, David McDowell Clay, James Alden Deyrup, Cora Ann Diamond, Laudie E. Dimmette, Harry Filmore Dowling, Jr., William Alexander Frohlich, Barbara Lucille Gallagher, Thomas Keith Glennan, Jr., Natalia S. Harkaway, Jean Marilyn Haught, Sherry Osmond Hessler, Martin Peter Jurkat, Maxine Joyce Marcus, Penelope Evelyn Mason, Mary Jane Moody, Patricia Anne Niles, Charles Joseph Odenweller, Jr., Vasken Paragamian, Gordon Gilbert Power, Jr., Elizabeth Wood Rittenhouse, Mary Markley Roberts, William I. Rosenblum, Mary Lupton Schenck, Nancy Sherry, Stuart Joel Silvers, David Hallock Smith, Phoebe Starfield, Barbara Elizabeth Swarthout, David Purnell Tice, Stephen Brougner Watkins, Dorothy Maria Edith Winter, Betty Jane Yannet, William Robert Young.

HIGH HONORS:

Terry Barbee Armstrong, Daniel Louis Aubry, Sigmund Austin Beck, Barbara Anne Behnke, Sheila Brody, Beverly Jane Bruhn, Robert David Cahn, Michael Henry Coopersmith, Nicole Tissot Crosby, Carol Charna Edelstein, Philip Ashley Fanning, Dorothy Elizabeth Fuller, Carolyn Joan Gaiser, William Owen Kafes, Arthur Karlin, Ann Louise Maples, Anoush Miridjanian, Susan Parker Nason, Jon Alvah Peterson, Judith Martha Shimansky Prewitt, Stephen Barry Rubin, Michael Edward Schoeman, Deborah Burke Smith, Jeremy J. Stone.

HIGHEST HONORS:

Ronald George Bodkin, Victoria Stephanie Crane, Clifford Earle, Jr., William David Foulkes, Lois Anne Glass, Nancy Ann Kaltreider, Paul Henry Monsky, Stephen S. Wolff.

DISTINCTION IN COURSE AWARDED BY THE FACULTY

George O'Bryan Bailey, Jr., Arthur Michael Conning, Felicia Forsythe, Mary L. Frorer, Harriet Edith Mangrum, John A. Rowe, Johann Peter Schickele, David Ross Sonneborn.

ELECTIONS TO HONORARY SOCIETIES

PHI BETA KAPPA:

Ronald George Bodkin, Sheila Brody, Beverly Jane Bruhn, Robert David Cahn, Arthur Michael Conning, Michael Henry Coopersmith, Victoria Stephanie Crane, Clifford Earle, Jr., William David Foulkes, Dorothy Elizabeth Fuller, Lois Anne Glass, William Owen Kafes, Nancy Ann Kaltreider, Arthur Karlin, Ann Louise Maples, Anoush Miridjanian, Paul Henry Monsky, Mary Jane Moody, Susan Parker Nason, Patricia Anne Niles, Judith Martha Shimansky Prewitt, William I. Rosenblum, Michael Edward Schoeman, Deborah Burke Smith, David Ross Sonneborn, Jeremy J. Stone, Stephen S. Wolff.

SIGMA XI:

Dorothea Louise Borgmann, Michael Henry Coopersmith, Clifford John Earle, Jr., Lois Anne Glass, Arthur Karlin, Eugene L. Leboy, Paul Henry Monsky, Vasken Paragamian, Benjamin Breneman Snively, David Ross Sonneborn, Stephen S. Wolff.

SIGMA TAU:

George O'Bryan Bailey, Hugh F. Coyle, Jr., Eugene Gertler, Thomas Keith Glennan, Jr., Charles Joslin Hurst, Charles Joseph Odenweller, Benjamin Breneman Snively, Stephen S. Wolff, William R. Young.

SWARTHMORE COLLEGE FELLOWSHIP AWARDS

- The Hannah A. Leedom Fellowship to* BEVERLY JANE BRUHN.
The Joshua Lippincott Fellowship to JON ALVAH PETERSON
The John Lockwood Memorial Fellowship to JOHN A. ROWE
The Lucretia Mott Fellowship to PATRICIA ANNE NILES; *Alternate,* BETTY JANE YANNET.
The Phi Beta Kappa Fellowship to JUDITH MICHAELA KAPP, '56

SPECIAL AWARDS *

- The Ivy Medal to* RONALD EUGENE SUTTON.
The Oak Leaf Medal to BARBARA JANE DEATON.
The McCabe Engineering Award to THOMAS KEITH GLENNAN, JR.
The John W. Nason Award to EVERETT L. HUNT, Dean Emeritus and Professor of English Literature.
The Crane Prize to RUSSELL S. TRENHOLME.
The Katherine B. Sicard Prize to ESTHER GLASER AND JOANNA GOTTFRIED.
The William Plummer Potter Public Speaking Fund Awards:
The Potter Public Speaking Contest: first prize, SIGMUND A. BECK; second prize, THEODOR H. NELSON; third prize, JEAN MARY POTTER.
The Potter Poetry Contest: first prize, ESTHER GLASER; second prize, PHILIP FANNING.
The Potter One-Act Play Contest: first prize, THEODOR H. NELSON.
The John Russell Hayes Poetry Prizes: first prize, CAROLYN GAISER; second prize, HARRIET SHORR.
The Lois Morrell Poetry Award to JOAN MOFFIT.
The Scott Award to WILLIAM POOLE, JR.
The Sarah Kaighn Cooper Scholarship to HAROLD NATHANIEL WARD.
The American Viscose Scholarship to ELIZABETH HORMANN.
The Radio Corporation of America Scholarship to HAROLD NATHANIEL WARD.
The Westinghouse Achievement Award to JAMES S. HATHCOCK, JR.

* A description of each of these awards may be found in another section of the catalogue.

Enrollment of Students by Classes, 1956-57

	<i>Men</i>	<i>Women</i>	<i>Total</i>
Seniors '57	114	104	218
Juniors '58	98	88	186
Sophomores '59	124	117	241
Freshmen '60	137	119	256
	473	428	901
Special	8	3	11
Graduate	5	1	6
	486	432	918

Geographical Distribution, 1956-57

New York	201	Idaho	1
Pennsylvania	196	Montana	1
New Jersey	86	New Mexico	1
Illinois	47	North Dakota	1
Maryland	45	Tennessee	1
Massachusetts	41	West Virginia	1
Ohio	26	Hawaii	3
Connecticut	25	Puerto Rico	1
Delaware	21		
Virginia	18	Total number of students	
District of Columbia	17	from U. S. and territories	878
California	17		
Michigan	16	Great Britain	6
Indiana	14	Germany	4
Missouri	13	Ghana	3
Texas	8	Italy	3
Wisconsin	8	Japan	3
North Carolina	7	Korea	3
Vermont	7	Saudi Arabia	3
Florida	6	Greece	2
Maine	6	Lebanon	2
Colorado	5	Austria	1
Nebraska	4	B. W. I.	1
Iowa	3	Canada	1
Kentucky	3	Ceylon	1
New Hampshire	3	Eire	1
Oregon	3	Guatamala	1
Rhode Island	3	Jordan	1
South Dakota	3	Netherlands	1
Washington	3	Nigeria	1
Alabama	2	Turkey	1
Georgia	2	Venezuela	1
Minnesota	2		
Louisiana	2	Total from abroad	40
Oklahoma	2	Grand Total	918
Utah	2		
Arizona	1		

Selected Publications About Swarthmore College

- AYDELOTTE FRANK, Breaking the Academic Lockstep; the Development of Honors Work in American Colleges and Universities, N. Y., Harper, 1944. 183 p.
- CARTER, BOYD G., Swarthmore under Frank Aydelotte. *Association of American Colleges Bulletin*. v. 28, p. 316-19. May 1942.
- GAGER, CHARLES S., Theatres, Gardens and Horticulture. *Science*. v. 95, p. 635-39. June 26, 1942.
- KNAPP, ROBERT H. and GOODRICH, H. B., Origins of American Scientists. The University of Chicago Press, 1952.
- KNAPP, ROBERT H., and GREENBAUM, JOSEPH J., The Younger American Scholar, His Collegiate Origins. The University of Chicago Press, 1953.
- NASON, JOHN W., Cooperation between Haverford, Bryn Mawr and Swarthmore. *Haverford Review*. v. 1, p. 4-7. Autumn 1941.
- NICHOLSON, ARNOLD W., People's Garden. *Saturday Evening Post*. v. 217, p. 26-27. April 14, 1945.
- PENNOCK, J. ROLAND, The Swarthmore Honors System. *Journal of Higher Education*. v. 24, p. 57-64, February 1953.
- SHAW, CHARLES B., Library Cooperation between Bryn Mawr, Haverford and Swarthmore. *Haverford Review*. v. 1, p. 24-26. Summer 1942.
- SWARTHMORE COLLEGE, The Inauguration of Courtney Craig Smith as President of Swarthmore College, October 17, 1953. In *Bulletin of Swarthmore College*. v. 51, no. 3, November 1953.
- SWARTHMORE COLLEGE, Tailored to the Individual. *Business Week*. June 8, 1957. p. 128-44.
- SWARTHMORE COLLEGE FACULTY, Adventure in Education: Swarthmore College under Frank Aydelotte. N. Y. Macmillan, 1941. 236 p.
- WALTON, JEAN B., Recent Changes in Group Activities Program at Swarthmore College. *Journal of the National Association of Deans of Women*. v. 6, p. 164-65. June 1943.
- WISTER, JOHN C. The Arthur Hoyt Scott Horticultural Foundation: a Ten Year History: January 1, 1930 to December 31, 1939. In *Bulletin of Swarthmore College*. v. 37, no. 5. Sixth Month 1940. 89 p.
- YODER, ROBERT M., Station-Wagon College. *Saturday Evening Post*. v. 222, no. 15, p. 40. October 8, 1949.

Index

- Absence from classes and Collection, 62
Absence from Examinations, 63
Academic Requirements, Committee on, 19, 63
Addams, Jane, Peace Collection (See Swarthmore College Peace Collection)
Administrative Officers, 20-22
ADMISSIONS PROCEDURE, 28-30
 Application Dates, 29
 Scholastic Aptitude and Achievement Tests, 29, 30
 School Subjects Recommended, 29
Advanced Degrees, 64-65
Advanced Standing, 30
Advisors, 48
Alumnae Scholarship, 36
Alumni Association, Officers of, 11
Alumni Council, 11
Alumni Office, 22, 48
American Cyanamid Company Scholarship, 38
American Viscose Corp. Scholarship, 38
Armstrong (Edward R.) Scholarship, 34
Arthur Hoyt Scott Horticultural Foundation, 44
Astronomical Observatories, 42, 70
Astronomy, Courses in, 70-71
Athletic Fields, see Map, 166
Athletics and Physical Education, 166
Atkinson (Barclay G.) Scholarship, 40
Atkinson (Rebecca M.) Scholarship, 40
Attendance at Classes and Collection, 62
Automobiles, Regulations concerning, 49
Awards and Prizes, 66-67, 157

Bachelor of Arts Degree, 64
Bachelor of Science Degree, 64
Baker, (George F.) Scholarships, 33
Benjamin West House, 45, 166
Benjamin West Lecture, 45
Bibliography of Swarthmore, 160
Biddle Memorial Library, 42
Biology, Courses in, 72-77
Board of Managers, Committees of, 9, 10
Board of Managers, Members of, 8, 9
Book Bill, 31
Botany, Courses in, 73-74

BUILDINGS, see Map, 166
 Activities and Class Lodges
 Astronomical Observatories
 Bartol Research Foundation
 Bassett House
 Beardsley Hall
 Benjamin West House
 Biddle Memorial Library
 Bond Memorial
 Chemistry, Hall of
 Faculty Residences
 Field House
 Hall Gymnasium
 Hicks Hall
 Isaac H. Clothier Memorial
 Library Building
 Martin (Edward) Biological Laboratory
 Meeting House
 Palmer Hall
 Pittenger Hall
 Parrish Hall
 Roberts Hall
 Scott (Arthur Hoyt) Outdoor Auditorium
 Somerville Hall
 Sproul Observatory
 Students' Observatory
 Swimming Pool
 Thomas House
 Trotter Hall
 Wharton Hall
 Worth Hall
Bunting (Ella Frances) Extemporaneous Speaking Contest, 67

Calendar, College, 5-6
Calendar, Lunar, 4
Chemistry, Courses in, 78-81
Chi Omega Scholarship, 39
Churches, 46
Class of 1913 Loan Fund, 41
Class of 1915 Scholarship Fund, 38
Class of 1916 Loan Fund, 41
Class of 1930 Scholarship, 38
Class of 1931 Scholarship Fund, 38
Classics, Courses in, 82-84
Cole (Sarah Antrim) Scholarship, 39
Collection, 47
Collection Attendance, Regulation concerning, 47, 62

Index

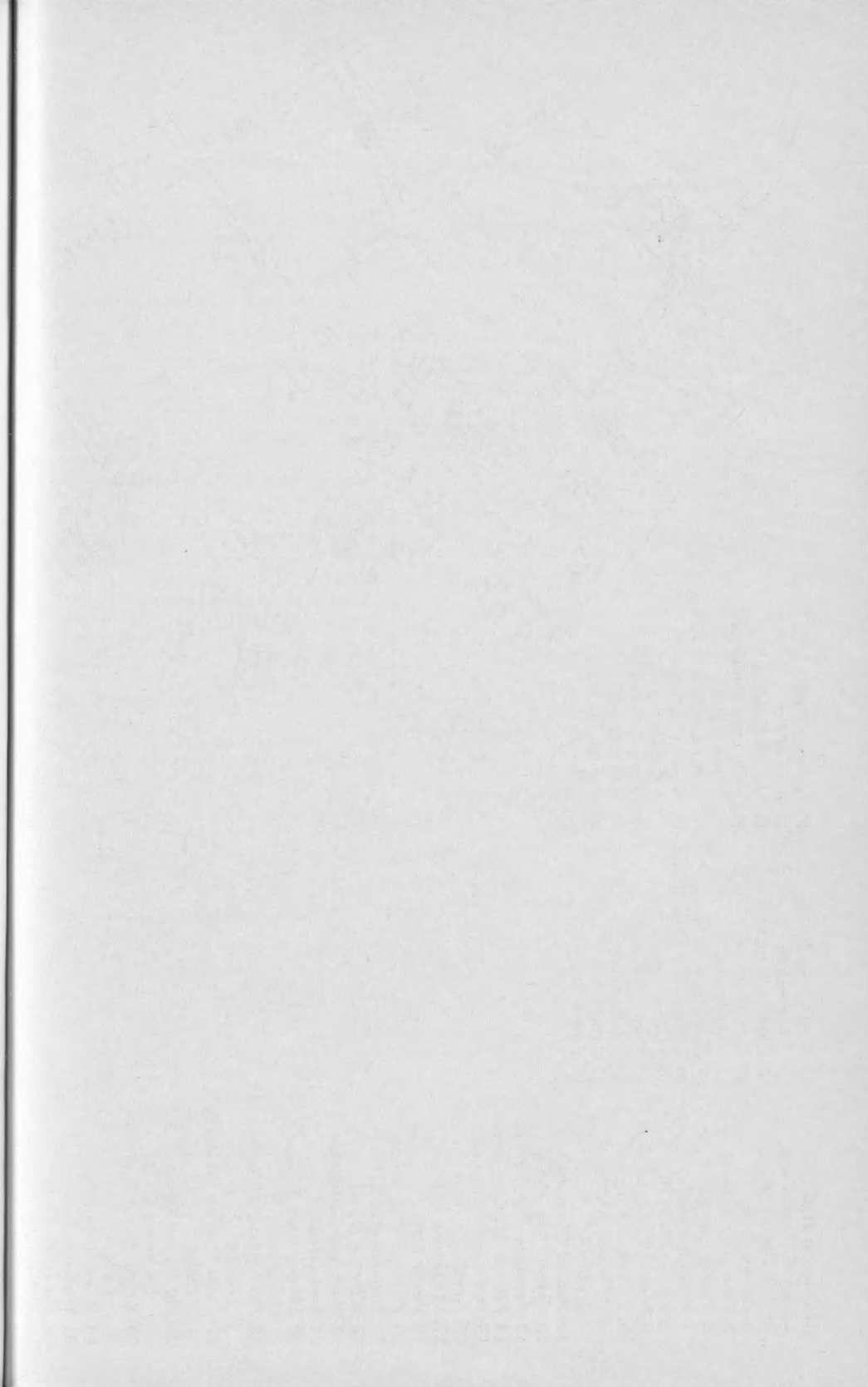
- College Community, 25, 49
College Entrance Examinations, 29-30
College Jobs, 33
Committees of the Board of Managers, 9, 10
Committees of the Faculty, 19
Comprehensive Examinations, 55, 57
Cooper (Sarah Kaighn) Scholarship, 35
Cooper (William J.) Foundation, 43-44
Cooperation with Neighboring Institutions, 24, 149
Corporation, Officers of, 8
Course Advisers, 48, 57
COURSES OF INSTRUCTION, 69-149
 Astronomy, 70-71
 Biology, 72-77
 Chemistry, 78-81
 Classics, 82-84
 Economics, 85-87
 Engineering, 88-99
 Civil, 90-92
 Electrical, 93-96
 Mechanical 97-99
 English Literature, 100-104
 Fine Arts, 105-107
 History, 108-112
 International Relations, 113, 138
 Mathematics, 114-116
 Modern Languages, 117-124
 Music, 125-127
 Philosophy and Religion, 128-132
 Physical Education for Men, 133
 Physical Education for Women, 134-135
 Physics, 136-137
 Political Science, 138-142
 Psychology and Education, 143-148
 Russian Studies, 149
Crane Prize, 66
Cutting (Bronson M.) Collection, 45
DEGREES, 64-65
 Advanced Engineering
 Bachelor of Arts
 Bachelor of Science
 Master of Arts
 Master of Science
Degrees Conferred, 153-157
Delta Gamma Scholarship, 40
Dining Rooms, 46
Directions for Correspondence, 2
Directions for Reaching the College, 24
Distinction in course, 58
Divisions and Departments, 18
Dormitories, 46
Dorsey (William) Scholarship, 40
Economics, Courses in, 85-87
Education, Courses in, 143, 146
Education, Physical, 133-135
Educational Program, 25, 54-61
Ellsler (George) Scholarship, 40
Emeritus Professors, 12
Engineering, Courses in, 88-99
Engineering, Degrees in, 54, 64-65, 88
English Literature, Courses in, 100-104
Entrance Requirements, 28-30
Examination Regulations, 63
Examinations, College Board, 29, 30
Exclusion from College, 64
Expenses, 31
Extra or Fewer Courses, 63
Extra-Curricular Activities, 50
Faculty, Members of, 12-17
Faculty Regulations, 49, 62-64
Fees (Tuition, Residence, etc.), 31
Fellowships, 67-68
Ferguson (Donald Renwick), Scholarship, 35
Fine Arts, Courses in, 105-107
Foreign Language Requirements, 56, 57
Foreign Students, 159
Foreign Study, 61
French, Courses in, 117-119
Friends College Scholarships, 41
Friends Historical Library, 21, 42
Friends Meeting, 46
Geographical Distribution of Students, 159
German Language and Literature, Courses in, 120-122
Gillingham (Joseph E.) Fund, 40
Grades, 62
Graduation, Requirements for, 64
Grants-in-aid, 33
Greek Language and Literature, Courses in, 82-84
Hayes (John Russell) Poetry Prizes, 67
Health, Care of Student, 47-48
Hillborn (Rachel W.) Scholarship, 38
History, Courses in, 108-122

Index

- Honors, Reading for, 58-60
Examiners, 60, 152
Housing, 25, 46
- Infirmaries, 47
Insurance, Accident and Sickness, 32, 47
International Relations, Courses in, 113, 138
Ivins (Aaron B.) Scholarship, 34
Ivy Award, 66, 158
- Johnson (George K. and Sallie K.) Fund, 36
Johnson (Howard Cooper) Scholarship, 35
- Kappa Alpha Theta Scholarship Fund, 37
Kappa Kappa Gamma Scholarship, 40
Kovalenko (Jessie Stevenson) Scholarship, 37
- Lafore Scholarship, 39
Latin Language and Literature, Courses in, 83-84
Lawrence (E. Hibberd) Scholarship, 37
Leedom (Hannah A.) Fellowship, 68
Leedom (Thomas L.) Scholarship, 40
LIBRARIES, 21, 42-43
 Biddle Memorial, 42
 College, 42
 Friends Historical, 42-43
Lilly (Scott B.) Scholarship, 34
Lippincott (Joshua) Fellowship, 68
Lippincott (Sarah E.) Scholarship, 40
Loans to Students, 33, 41
Location of the College, 24
Lockwood (John) Memorial Fellowship, 68
Longstreth (Mary T.) Scholarship, 37
Lucretia Mott Fellowship, 68
- Managers, Board of, 8, 9
Map of College Grounds, 166-167
Martin Biological Laboratory, 42
Mary Lyon School Property, 46
Mathematics, Courses in, 114-116
McCabe Engineering Award, 66, 158
McCabe (Thomas B.) Scholarship, 34
Meeting House, 46
Men's Student Government, 50
Mertz (Peter) Scholarship, 35
Miller Flounders Scholarship, 35
Miller (James E.) Scholarship, 39
Miller (John A.) Loan Fund, 41
Moon (Owen) Fund for Public Speaking, 67
Morrell (Lois) Poetry Award, 67
Mott (Lucretia) Fellowship, 68
Music, Courses in, 125-127
- Nason (John W.) Award, 66
Newton (A. Edward) Library Prize, 66
- Oak Leaf Award, 66, 158
Observatories, Astronomical, 42, 70
Open Scholarships for Men, 33-34
Open Scholarships for Women, 36
- Paiste (Harriet) Fund, 36
Palmer Hall, 46
Parrish Hall, 46
Pearson (Paul M.) Loan Fund, 41
Perkins (T. H. Dudley) Memorial Scholarship, 35
Phi Beta Kappa Fellowship, 68
Philosophy, Courses in, 128-132
Physical Education for Men, 133
Physical Education for Women, 134-135
Physical Education Requirements, 63, 133-135
Physics, Courses in, 136-137
Pittenger Hall, 46
Plan of College Grounds, 166-167
Political Science, Courses in, 138-142
Potter Speech Collection, 45
Potter (Wm. Plummer) Public Speaking Fund, 67, 158
Pre-Medical Program, 60-61
Preston (Mary Coates) Scholarship Fund, 36
Prizes, 66-67, 158
PROGRAM OF STUDY, 54-61
 For Freshmen and Sophomores, 55-57
 For Juniors and Seniors, 57-60
 Honors Work, 58-60
 Pre-Medical Program, 60-61
Psychology, Courses in, 143-148
Public Speaking Prizes, 66-67, 158
- RCA Scholarship, 37
Reeves (Mark E.) Scholarship, 40
Religion, Courses in, 128-132
Religious Life, 46-47
Requirements for Admission, 28-30
Requirements for Graduation, 64

Index

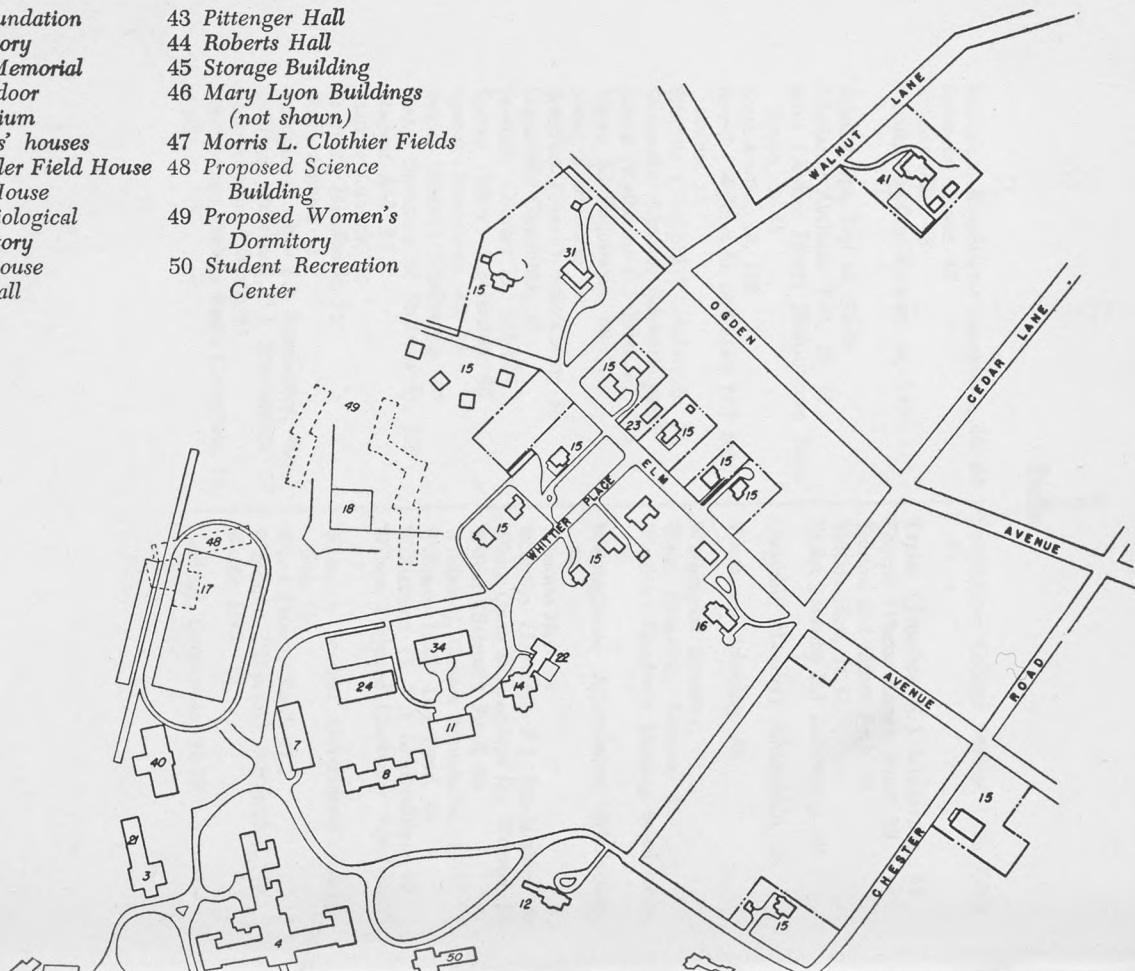
- Residence, Regulations concerning, 46, 64
Robinson House, 46
Roberts Hall, 46
Russian Studies, Courses in, 149
- Scholarships, List of, 33-40
Scholastic Aptitude Test, 29, 30
Scott (Arthur Hoyt) Horticulture Foundation, 44-45
Scott Award, 34, 158
Serrill (William G. and Mary N.) Scholarship, 35
Sharples (Philip T.) Scholarship, 34
Shoemaker (Annie) Scholarship, 36
Sicard (Katherine B.) Prize, 67, 158
Sigma Xi Fellowship, 68
Social Committee, 50
Solomon (Frank) Scholarship, 36
Somerville Committee, 50
Spanish, Courses in, 123-124
Sproul (Mary) Scholarship, 40
Sproul Observatory, 42, 70
Squier (Helen) Scholarship, 40
States, Summary of Students by, 159
Student Aid, 33
Student Council, 50
Student's Handbook, 51
Study Abroad, 61
Sullivan (Joseph T.) Scholarship, 40
Sullivan (Marshall P.) Scholarship, 37
Summer School Work, 63
Swarthmore College Peace Collection, 21, 43
- Swarthmore College Student Loan Fund, 41
- Taylor (Jonathan K.) Scholarship, 39
Thorne (Phebe Anna) Fund, 39
Tuition and Other Fees, 31
Tuition Plan, 31-32
Tyson (Martha E.) Fellowship, 68
- Underhill (Daniel) Scholarship, 38
- Vocational Advising, 48
- Washington Semester, 61
West, Benjamin, Lecture, 45
Westbury Quarterly Meeting Scholarship, 39
Westinghouse Achievement Scholarship, 38
Wharton Hall, 46
Wharton (Deborah F.) Scholarship, 40
White Open Scholarships for Women, 36
Willetts (Samuel) Fund, 40
William J. Cooper Foundation, 43-44
Williams (Ellis D.) Fund, 41
Williamson (I. V.) Scholarships, 40
Wilson (Edward Clarkson) Scholarship, 37
Women's Student Government Association, 50
Wood (Mary) Fund, 37
Woodnutt (Thomas) Scholarship, 40
Worth Hall, 46
- Zoology, Courses in, 74-77

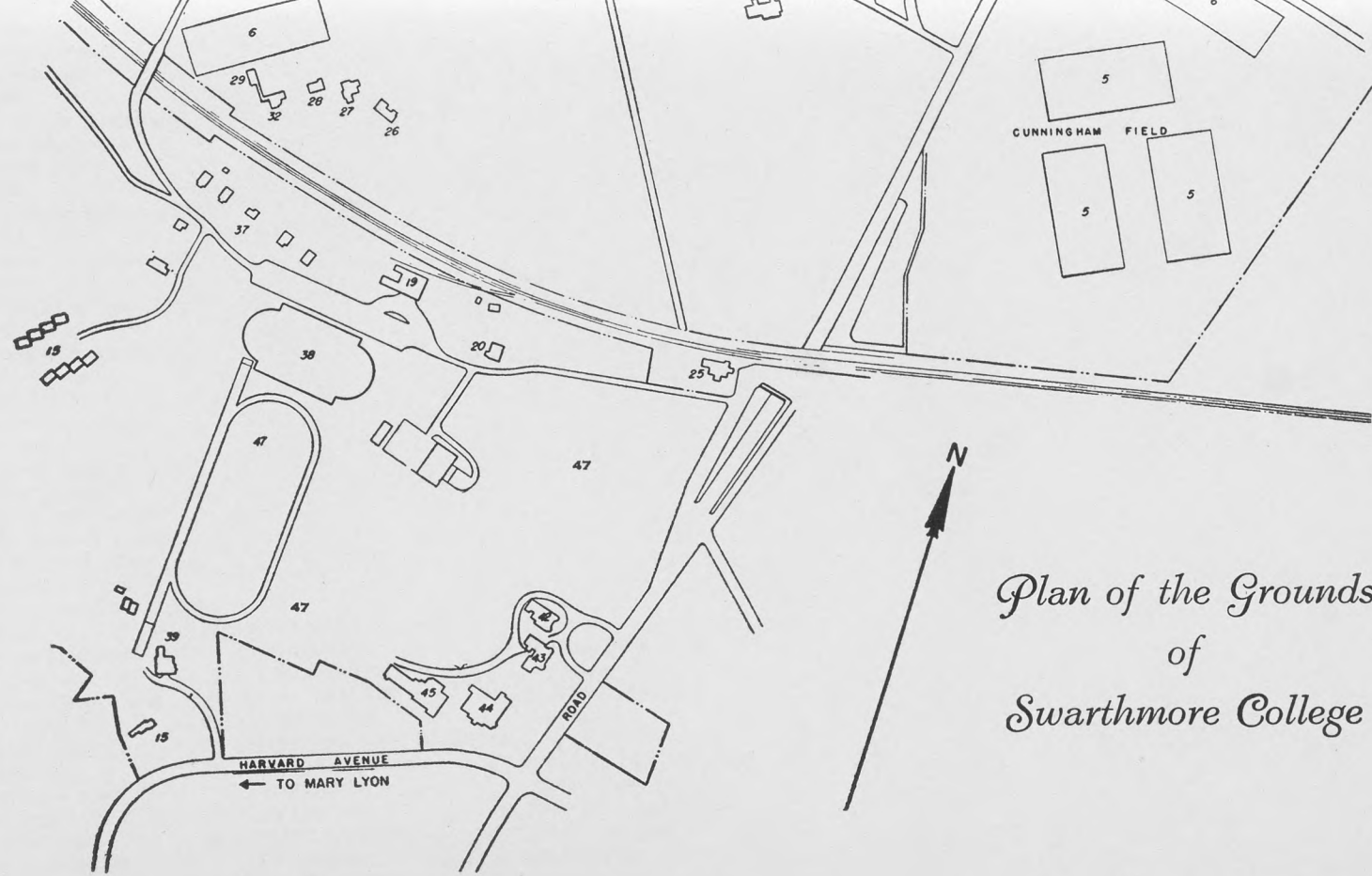


- 1 Wharton Hall
- 2 Sproul Observatory
- 3 Hall Gymnasium
- 4 Parrish Hall
- 5 Cunningham Field
- 6 Tennis courts
- 7 Beardsley Hall
- 8 Trotter Hall
- 9 Somerville Gymnasium
- 10 College Library and Friends Historical Library
- 11 Hall of Chemistry
- 12 Cunningham House
- 13 Benjamin West House
- 14 Friends Meeting House
- 15 Professors' residences
- 16 President's house
- 17, 18 Alumni Field
- 19 Power plant
- 20 Employees' dormitory
- 21 Swimming pool
- 22 Whittier House
- 23 Book and Key House
- 24 Hicks Hall
- 25 Pennsylvania R. R. Station
- 26 Phi Kappa Psi Fraternity Lodge
- 27 Delta Upsilon Fraternity Lodge
- 28 Phi Sigma Kappa Fraternity Lodge
- 29 Kappa Sigma Fraternity Lodge
- 30 Worth Dormitory
- 31 Woolman House
- 32 Phi Delta Theta Fraternity Lodge

- 34 Bartol Foundation Laboratory
- 35 Clothier Memorial Auditorium
- 37 Employees' houses
- 38 Lamb-Miller Field House
- 39 Thomas House
- 40 Martin Biological Laboratory
- 41 Bassett House
- 42 Palmer Hall

- 43 Pittenger Hall
- 44 Roberts Hall
- 45 Storage Building
- 46 Mary Lyon Buildings (not shown)
- 47 Morris L. Clothier Fields
- 48 Proposed Science Building
- 49 Proposed Women's Dormitory
- 50 Student Recreation Center





*Plan of the Grounds
of
Swarthmore College*

University College
of
Duke of the University





